REPORT

ON THE

CLIMATOLOGY AND EPIDEMICS OF SOUTH CAROLINA.

BY

MANNING SIMONS, M.D.,

CHARLESTON, SOUTH CAROLINA.

EXTRACTED FROM THE

TRANSACTIONS OF THE AMERICAN MEDICAL ASSOCIATION.

PHILADELPHIA:

COLLINS, PRINTER, 705 JAYNE STREET.

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South Carolina possesses a climate almost as varied as the physical features of the country which composes its different sections.

To render a clear description of the climate, and its relations to the health and diseases of the State, it is well that we should first make a brief survey of the character of its territory, and mark its geographical situation.

Wedged in between North Carolina on the north, northeast, and Georgia on the west, it is bounded on two sides of the triangle which constitutes its figure by water; the Atlantic Ocean on the east, southeast, and the Savannah River on the west. It lies between 30° 4′ 30″ and 35° 12′ north latitude, and 78° 25′ and 83° 40′ west longitude from Greenwich, and covers an area of about 30,000 square miles.

The physical features of the country vary with the proximity or distance from the coast of the different sections. Passing from the coast line north-northwest, the country is flat, and rises in an almost evenly gradual ascent until the mountains are reached, when a height of 3000 to 4000 feet is attained at their highest points.

"South Carolina is equally divided between the primitive and alluvial region." The alluvial extends about 100 miles from the sea-coast, and the primitive occupies the rest of the State. Within the first are found marine shell limestone and its attendants. The upper border of this formation passes in a northeasterly direction from the Savannah River, through the lower portions of Sumter, Darlington, and Marion, into North Carolina, forming almost a parallel with the sea-coast.

In the primitive formation, which extends from this line north-northwest, is found the granite and its attendants.

Each of these geological formations impresses its character upon the physical conformation of the country which it embraces; and at the same time influences the climate, and to a certain extent the diseases incident to the divisions severally.

In considering the physical features of the sections, we will begin with the sea islands, which are scattered along the coast from Winyaw Bay to the Savannah River. These islands are generally sandy, and for the most part healthy, being open to the sea, and under the influence of the fresh pure sea breeze and winds; removed moreover from the generating sources of malaria. To these succeeds the flat country, which extends for about 100 to 120 miles, when it terminates in the "Sand Hill" region. This Sand Hill region deserves more than the passing notice which we can give it. It is a belt of about 30 miles wide, extending in a direction from northwest to southwest, and passes through this State into North Carolina and Georgia. "It corresponds with the point of transition of the tertiary to the primitive geological formation, and in some places presents an admixture of some of the elements characteristic of both."

The surface soil of this region is generally pure white sand, resembling that of the sea islands, and maintains this character to some depth.

This region appears to have once formed the shores of the ocean, which covered all the country below it. It is traversed by numerous small streams, or branches, as they are denominated, of clear, pure water, which wend their way to the rivers to which they pay their tribute. These streams are fed by natural springs, which flow from the sandy soil, of an icy coldness.

Taking the whole year round, there is no country more healthy.

The rivers in this section are bordered by a great extent of alluvial soil, extremely fertile, but at the same time unhealthy, and they furnish a stronghold and workshop for malaria.

Here, therefore, we have health and sterile soil allied, and fertility combined with unhealthiness.

Situated on the highest point of this Sand Hill range is Aiken, well known as a sanitary resort for invalids suffering with pulmonary troubles. This town, situated partly in Barnwell, partly in Edgefield Counties, is 120 miles from the coast, and has an elevation of 600 feet above the sea. The climate is characterized by a dry atmosphere; the mean temperature is 61.69°, and the mean temperature of the cold season 51.63°. We would refer to a

pamphlet, by Drs. A. Coffin and W. H. Geddings, for an exhaustive treatise on Aiken, as a sanitary resort.

From the Sand Hill region north-northwest, the character of the country is rolling; the sandy soil is exchanged for one of red clay, and the scenery becomes more varied. This country gradually passes into the mountainous region, and the section is reached into which the Allegheny range of mountains projects, the highest points of which rise from 3000 to 4000 feet above the ocean.

In reviewing this change of country, which embraces all the phases and transitions from sea-coast to mountains, one must be impressed with the natural inference that the climate must vary proportionally, and such indeed is the case, and to a certain extent the diseases also with the physical features.

"The upper part of South Carolina," says Mills, in his statistics, "we would repeat, is full of interesting scenery; her mountains present every variety of the wild, abrupt, sublime, beautiful, grand, and awful. Her rivers offer numerous cascades, placid surfaces, foaming torrents, and deep waters; the climate is the most delightful in the world; the Montpelier of the United States (as the amiable Abbè Corrè, ambassador of the King of Portugal, observed when he visited this State), the very seat of Hygeia herself."

Having arrived at the northern boundary of the State in our description thus far, we will retrace our steps, and in so doing refer to the rivers, and their variation in character in the different sections; for, as we will see, the health and diseases depend very much upon their nature.

The whole State is intersected by numerous rivers and streams, which uniting form combinations fewer in number but of greater size, which wind their serpentine course through the length and breadth of the country, to add their mite to the vast volume of the Atlantic.

The mountain region gives origin to a number of streams, which uniting themselves form the Broad and Saluda; these two coming together constitute the Congaree. The Savannah River, which rises in the mountains of North and South Carolina, traverses the whole length of the State from mountains to sea-coast, and forms its western boundary. The Catawba, arising in North Carolina, passes into South Carolina, where, with the numerous tributaries which it receives in its course, it forms the Wateree. This latter with the Congaree forms the Santee. The Great and Little Peedee

also, which rise in North Carolina, pour through the northeastern portion of the State, and empty into Winyaw Bay.

These rivers, especially those in the northwest, possess all the characteristics for about half their course of mountain streams. They rush their headlong course, and precipitate themselves over their rocky beds, forming cascades and numerous falls of great beauty. In this impetuous temper, they continue their course until the upper border of the tertiary geological formation, already mentioned, is reached, when they become calm and placid, as if preparing themselves at the end of their mad race for their termination in the ocean.

Augusta, Columbia, and Camden mark the points of transition, from the turbulence of mountain torrents to tranquillity, for the Savannah, Congaree, and Wateree respectively. The Savannah, Santee, and Peedee may therefore be regarded as the great channels by which the mountain waters find their way into the ocean.

From the points at which these rivers become tranquil, and smooth in their course, their borders change character with the streams. Here the well-known and historical swamps make their appearance and extend in some places to the distance of five, six, and even seven miles on either side. The borders of these rivers, therefore, present miles and miles of swamp land, which, in proportion to the character of the seasons, are alternately overflowed and dried, leaving a vast area of land impregnated with organic vegetable and animal matters exposed to the action of the sun. Here the naked cypress raises its branches stained with the clay marks of many a freshet, warning as it were against the subtle malaria which everywhere surrounds. Here, too, the dark beautiful green foliage of the water or live oak betokens the enriching power exercised upon the soil by that very process which accompanies the production of the poison.

The Sand Hill region gives origin to many streams, and branches which unite to form rivers. The Edisto, Salkahakhie, Combahee, Black River, etc., are all the result of these combinations of smaller streams which rise in this region. Most of these are derived from the pure springs already alluded to as abounding in the Sand Hill region. The waters of which they are composed are pure and clear near their sources, and maintain this character for some extent of their course, until their purity is marred by the accessions of surface water which they receive. A beautiful instance of this clear crystal character is given by the Eutaw Creek, which derives

its supply from the spring which is situated near, and bears the name of, one of the historical battle-fields of the Revolution of 1776. The waters of this creek are so clear and limpid, that minute objects can be distinctly seen on its bed, to the depth of 10 or 15 feet.

As the sea-coast is approached, there is another class of rivers of which the Cooper, Ashley, Wando, Waccamaw, Sampit, Stone, Ashepoo, Pocotaligo, Coosaw, Broad, etc., are types. They are peculiar in character, combining the nature of rivers with that of prolongations of the sea. They are generally wide and bordered with great expanse of marsh and black mud, with only an occasional bluff to change the monotony of the scene. They are generally affected by the rise and fall of the ocean tides, and in some of them even to their sources. Their waters are to some distance salt or brackish, but to what extent depends upon the seasons. At their heads they are supplied with fresh water derived from extensive swamps, and the drainage of the surface water of the neighboring country.

In the region of country bordering the coast and the rivers of the flat country, from the requirements of the cultivation of rice, there are many collections of fresh water called reserves. These are made as reservoirs to supply water for flowing the rice fields in the event of drought, and the consequent brackish state of the waters of the rivers just described. These collections of water, being still, offer a great superficial area to the process of evaporation, decomposition and decay. Their borders and surfaces, in the summer season, are covered with a green slimy mass, the result of the collection and accumulation of the putrescent and decayed animal and vegetable matters.

The rice fields border the rivers in the low country. They are on a level below the water line of the rivers, from overflow by which, they are protected by a system of banks or "dams." Trunks and floodgates connect these fields with the rivers, and furnish them their water supply. These fields are alternately flowed and drained during the spring and summer months, according to the exigencies of the rice crop, and therefore likewise furnish a fruitful source of malaria.

CLIMATE.—South Carolina lies "in the same parallel with Cyprus, Candia, Morocco, Barbary, Damascus, Tripoli, Palmyra, Babylon, and with other parts of Turkey in Asia, and with parts

of Persia, India, and China." "In comparing American climates with those of Europe, to bring them on a par with each other, a difference of 12 degrees should be allowed for peculiarities in the American Continent. The most remarkable of these is such a predominance of cold, as subjects an American, living in north latitude 35 to an equal degree of cold with an European residing in north latitude 47. If this opinion is correct, we should look for a resemblance of South Carolina, not in the countries which have been mentioned as lying in the same latitude, but in Aix, Rochelle, Montpelier, Lyons, Bordeaux, and other parts of France; in Milan, Turin, Padua, Genoa, Parma, Mantua, and other parts of Italy; in Buda, Beuda, Crimea, and other parts of Turkey in Europe; in Circassia, Astrachan, and other parts of Russian Tartary, and of Chinese Tartary, which lie between the 44th and 47th degrees of north latitude. It is certain that the points of resemblance are more numerous in the latter than the former case" (*Ramsay, Medical History of South Carolina*). "The climate of South Carolina is a medium between that of tropical countries and of cold temperate latitudes. It resembles the former in the degree and duration of its summer heat, and the latter in its variableness." It is favored with a serene, clear, blue sky, bright sunshine, sparkling stars, and soft moonlight, taking into consideration the influence of the ordinary inclemencies of the seasons. Its air is balmy, and the thermometric extremes moderate. The winters are short and gradually merge into the delightful weather of the southern spring. The summers are long, but the heat is by no means so great comparatively as is supposed by those who inhabit more northern and western regions. The character of the seasons varies, to some extent, with the proximity to, or distance from, the sea-coast.

Advancing to the north and northwest, the summers become shorter and the winters longer in proportion as the mountainous regions are reached. Though the summers are longer, and continue for 3 or 4 months, yet the thermometer rarely rises higher than in Baltimore, Philadelphia, and New York, and frequently the temperature of the latter is greater and exceeds that of this State.

The degrees of extreme heat are less in Charleston, and in the coast districts and islands, than in the interior and northwestern portions of the State. Two causes operate to bring about this result.

First. In situations near the sea and open to its influence, the sea breezes, which spring up generally about 10 A.M., temper the great heat and fan the heated inhabitants

Secondly. These situations are subject to frequent rain showers, generally accompanied by thunder and lightning, which quickly give way to bright sunshine and clear sky, but greatly reduce the temperature.

In Charleston the temperature rarely exceeds 95° Fahr., in the shade, and does not frequently reach this point, but usually varies from 80° to 90°. In Aiken and other points of the interior, the thermometer has attained the height of 102°.

This season, as we have remarked, is shorter in the mountainous portions of the State. In this section, during the night and early morning, a blanket is frequently found necessary to comfort, though the heat of the day may exceed that of the coast districts.

The annual mean temperature for Charleston is usually about 64° 38′, which may be taken as illustrative of that of the other sections lying on the sea-coast. The mean annual temperature of Aiken is 61.69°, as given by Drs. Coffin and Geddings, which may also, in the absence of data, represent that of the middle or Sand Hill region.

The number of extremely hot days is not great, and these do not exceed more than four or five successively.

The winters are short, seldom extending over a greater period than three or three and a half months. They are generally mild, and for the most part there is a clear, transparent atmosphere, with a bright sun. Many days are warm, resembling spring and even a moderate summer's day. The difference, mentioned in relation to summer, between the upper and lower sections, still obtains as to the winter. As the heat of summer is moderated by proximity to the sea, so is the severity of winter softened and tempered by the influence of the gulf stream, which brings its warmth from hotter climes. The winters seldom present any very great degree of cold, and though the cold days occur in greater number proportionally, to those which are distressingly hot in the summer season, yet they seldom continue except for a short period, and only in succession of five or six at any one time.

Frost rarely occurs earlier than the 26th of October, and generally makes its first appearance early in the month of November; earlier, however, in the interior than on the seaboard. Snow is but rarely seen in the lower portions of the State, and then in quantity scarcely sufficient to cover the ground. In the upper districts, however, the mountains are, near the northwest boundary, frequently covered with snow, but even here it does not remain

upon the ground for any lengthy period. In these sections the winters are often severe and approach in character those of northern regions. They also begin earlier, and the cold weather continues longer than in the more southern portions of the State.

South Carolina is subject to frequent rain-falls, which occur most frequently in January, June, July, and August, and especially in the lower districts. The condition of the atmosphere, as to moisture, differs materially in the several sections of the State, and this variation depends much upon the physical character and location. In the lower counties and on the sea-coast, the dew point is generally high. This is accounted for by the following reasons: 1st. Proximity to the ocean. 2d. The numerous swamps, rivers, lowlands, rice fields, and the collection in low places in the flat country of the surface water, which, by reason of this very flatness, in the absence of proper drainage, is unable to find a free escape. 3d. The subsoil water is in many places on a level but a few inches below the surface.

On the islands, and on the coast, in proximity to the sea, digging to the depth of a few inches will cause an abundant spring of water, brackish however to the taste. In Charleston and its neighborhood, from wells sunk to the depth of from six to twelve feet, water can be obtained. This character changes, however, as the distance increases from the lower country, and in Aiken and other sections of the Sand Hill region the atmosphere becomes so dry and the dew point so low, that surgical instruments may be exposed for a lengthy period without rusting.

We here introduce the Meteorological Table for 1871, compiled from observations taken at Charleston, and regret that insufficient data have prevented us from giving similar reports from other sections of the State.

Meteorological Abstract of the Barometer, Thermometer, Dew Point, Winds, and Weather at Charleston, S. C., for the year ending December 31, 1871.

Taken under the direction of R. Lebby, M.D., City Registrar.

Months.	Barometer.			Thermometer attached.			Hottest day.	Coldest day.	Thermometer detached.								Register therm.		Dew point.	Prevailing winds at sunrise.	Prevailing winds at 4 P. M.	Weather.			Quantity of rain.	Prevailing weather.
									Mean Temperature.			Max.			Min.											
1871.	Maximum.	Minimum.	Range.	Mean. 8 A. M.	Mean. 2 P. M.	Mean. 8 P. M.			8 A. M.	2 P. M.	8 P. M.	8 A. M.	2 P. M.	8 P. M.	8 A. M.	2 P. M.	8 P. M.	Mean night.	Mean day.	Mean.			Fair.	Cloudy.	Rain	ins.	
January.....	30.500	30.020	.480	46.32	58.93	51.54	31	9	45.80	51.09	50.19	64	71	55	35	47	40	38.61	59.09	39.61	N. E.	N. E.	19	12	0	.85	fair
February....	30.514	29.866	.648	54.00	64.54	54.28	26	7	50.00	63.92	55.00	66	74	64	38	47	42	47.60	64.50	46.57	N. W.	N. W.,S.W.	17	8	3	3.74	"
March.....	30.400	29.812	.588	62.25	71.35	63.25	15	1	62.32	70.19	62.29	73	80	69	48	59	54	53.00	71.87	51.22	N. E.	S. W.	23	7	1	4.37	"
April.	30.500	29.614	.886	66.63	78.23	66.93	7	2	66.96	76.33	65.96	76	90	73	56	63	56	57.16	78.46	53.21	S. W.	S. W.	17	11	2	4.30	"
May.....	30.410	29.860	.550	73.32	79.58	72.45	22	6	73.29	79.19	71.16	80	89	79	56	65	57	60.35	80.35	55.86	S. E , S.W.	S. W.	21	8	2	3.74	"
June	30.300	29.900	.400	79.80	86.36	78.90	20	13	80.76	85.86	78.30	86	96	88	76	75	71	71.20	87.33	77 82	W.	S. W.	21	7	2	3.19	"
July.....	30.260	30.025	.235	83.87	88.06	80.96	10	25	81.45	90.16	80.77	89	102	88	71	80	72	71.51	91.54	66.11	W.	S. W.	26	5	0	.81	"
August	30.320	29.770	.550	75.12	85.06	79.12	4	19	82.96	85.72	78.87	87	94	84	73	75	72	71.51	86.06	70.51	N. E.	N. E.	15	13	3	16.18	"
September...	30.466	29.940	.526	74.10	78.63	72.53	17	30	71.16	78.53	72.03	83	88	80	57	72	60	63.17	77.27	62.03	N. E.	N. E.	11	10	9	5.29	"
October	30.464	29.875	.589	68.06	77.64	69.70	16	12	68.80	77.50	68.64	77	86	75	60	70	62	62.16	78.32	60.19	N. E.	N. E.	18	9	4	2.86	"
November ...	30.468	29.710	.758	58.46	68.13	57 80	30	1	58 16	67.82	54.00	74	84	74	40	45	40	51.16	75.20	49.98	N. E.	N. W.	20	8	2	3.64	"
December....	30.508	29.876	.632	47.77	59.58	50.79	24	21	45.87	58.87	49.19	61	77	66	30	37	33	41.32	59.67	40.57	N.	S. W.	21	8	2	2.00	"

DISEASES.—The diseases of South Carolina are none of them peculiar to its territory, nor do they differ from those, which exist in other portions of the United States, except perhaps the yellow fever. For healthfulness, it ranks high as compared with the other States, and its yearly mortality will bear a favorable comparison with that of other sections. In illustration of this point, we will introduce the mortuary reports of the City Registrar of the city of Charleston for the years 1866, 1867, 1868, 1869, 1870, and 1871. In order that these statistics may be understood, it is proper to state, that the proportion of whites and blacks to the total population is about equal. During the year ending December 31, 1866, there died in the city of Charleston:—

Whites	607
Blacks and colored	1164
Total	1771

Proportional mortality to population 1 in 19.774.
The entire population being estimated at 35,000.

In 1867.

Whites	462
Blacks and colored	879
Total	1341

Proportionate mortality to population 1 in 26.099.
Entire population estimated at 35,000.

In 1868.

Whites	390
Blacks and colored	818
Total	1208

Proportionate mortality to population 1 in 28.973.
Entire population estimated at 35,000.

In 1869.

Whites	453
Blacks and colored	918
Total	1371

Proportionate mortality to population 1 in 32.77.
Total population by census 1869, 44,923.

In 1870.

Whites	539
Blacks and colored	1075
Total	1614

Proportion of deaths to population 1 in 30.33.
Estimated population by census 1870, 48,956.

In 1871.

Whites	714
Blacks and colored	956
Total	1670

Proportion to population 1 in 28.11.

In reviewing these tables, one must be impressed with the justice of the preceding remarks. It will be observed that the death-rate of the blacks and colored is universally greater than that of the whites, and the number of deaths of the former is at a moderate estimate double that of the latter. 1871, it must be remembered, was a yellow fever year, and yet we find this disproportion in the death-rate unchanged, though the difference is not so marked as in the preceding years. We must observe that although the yellow fever existed in the summer of 1871, the mortality was not great enough to make any material difference in the proportional mortality.

On comparison of the years 1871 and 1866, we find that in the former the proportional mortality was 1 in 28.11, whilst in 1866 it was 1 in 19.774. This difference may be accounted for, in the different results of the census on which the calculation was made; but this is not sufficient to vitiate the value of the statistics, as the census by which the calculation of 1866 was made, was in all probability not a less accurate estimate of the population than that of 1871.

Principal among the diseases of South Carolina may be placed the malarial, in its various grades and types. These, however, as a rule, are mild; their character as to frequency and severity varying with different seasons. In some years the poison appears to be generated in greater quantity, and to be more concentrated. The congestive forms are, however, not frequently met with, and as compared with the types met with in the West are less malignant. From the brief sketch already made, it can well be understood why malaria claims the first consideration in a description of the dis-

eases of this State. In considering their distribution, we may make, for convenience, a rough division of territory into three sections.

I. The first of these may be made to comprise all that section lying intermediate between the sea-coast and Sand Hill region. Here exists all that combination of circumstances calculated to generate the malarial miasm, granting that the present most received opinion of its production, from decayed and decaying vegetable matter, under the influence of heat and moisture, be the correct one. In this region exist the wide extents of swamp land, either entirely or partially overflowed by the streams which they border, spreading for miles over the country. The land is flat, with deficient artificial drainage, and not sufficient natural slope or elevation to furnish a proper free escape for the accumulation of water, which becomes stagnant, and remains under the influence of the intense rays of the summer sun.

In this region are located for the most part the rice fields, which, as we have before said, are abundantly flowed with and drained of water, according to the requirements of the crop. With these are their reserves of stagnant water. Besides these sources of malaria, there arise from the flat nature of the country abundant collections of surface water, the result of the frequent and heavy rain-falls to which this section is subject. In addition, may be mentioned the subsoil water, which is but little below the surface. This section may therefore be denominated the malarious district. Even in this section, however, the malarial influence does not envelop all localities. There are many broad extents of barren pine land, which enjoy immunity from the poison, that may exist in all its virulence at the distance of only a few miles, which separate them from the sickly plantations.

These regions furnish summer resorts to many of the planters, who are able to go each day to the scene of their labors and return at nightfall to the "Pine Land," where they as a rule have immunity from malarial infection. The sea islands also form an exception to this general diffusion of malaria, at least those which are open freely to the sea; of these Sullivan's Island is an instance. It is a summer resort for the people of Charleston and the vicinity, and is (with the exception of a small area) free from this influence. This island even escapes, in most instances, the epidemic influence of yellow fever when this disease exists in all its virulence in the city of Charleston, distant only about five miles.

Charleston, situated on a tongue of land at the confluence of the

Cooper and Ashley Rivers, also possesses a remarkable freedom from malarial disease. Though bordered by marsh land, and in proximity to St. Andrew's and Christ Church parishes, it is rare for a case of malarial poisoning to have its origin in the city proper. The upper wards, composed of what was formerly known as the Neck, do not enjoy the entire immunity possessed by the lower portion, but even here malaria but rarely originates. Years ago, before the Neck and city proper were united under one municipal government, the former section was subject to a fever denominated "neck fever," a species of malarial disease. With the growth and increased population which the section has received, this disease has greatly diminished, and is now merely known as a tradition of the past.

II. The second division of the State may be made to include that portion of rolling clay land country which extends to the lower border of the mountain region. In this division, although malaria exists, it is by no means so diffused as in the preceding division, and is confined to certain regions, generally in the neighborhood of the water-courses. In the Sand Hill region proper, malaria does not exist; in fact it enjoys almost entire immunity, except in the swamps which border the rivers at or near its upper and lower boundaries.

III. Lastly, the third division may comprise the mountain region, where malaria arrives at its minimum.

The malarial diseases prevail in the latter part of spring and during summer and autumn, until the first heavy frost, when they disappear, to return with the next season. The cases which occur in winter are the result of infection during the preceding season, and are generally intermittents, frequently of the quartan type. These diseases, manifestations of malarial poisoning, are generally tractable, and mostly under the control of quinine properly administered. Typhoid fever exists, but rarely becomes epidemic, and though met with in all sections, is more frequent in the upper districts.

South Carolina is subject to its share of the generally diffused diseases of the chest; pneumonia, pleurisy, catarrhs, and throat affections are present, particularly in the winter season; but these are by no means so frequent as in the more northern region. This is particularly the case with bronchial catarrhs and throat affections.

It is well to note in this place the difference as to frequency of occurrence and fatality in relation to diseases of the chest, especially pneumonia, in the whites and negroes. The latter suffer far

more severely, and appear to have a peculiar vulnerability in respect to these diseases. All of our reports from the interior of the State concur in this statement. By way of illustration of this point, we will introduce the following figures from the city Registrar's reports of the city of Charleston, of the deaths from pneumonia, during the years 1866, 1867, 1868, 1869, 1870, and 1871.

During the year ending on December 31st, 1866, there died of pneumonia:—

Whites	18
Blacks and colored	75
Total	93

1867.

Whites	15
Blacks and colored	49
Total	64

1868.

Whites	10
Blacks and colored	31
Total	41

1869.

Whites	18
Blacks and colored	53
Total	71

1870.

Whites	16
Blacks and colored	54
Total	70

1871.

Whites	10
Blacks and colored	31
Total	41

It will be observed that the death-rate from all forms of pneumonia, among the blacks and colored, is always greater than among the whites, and that this proportion remains unchanged during the six years, the statistics of which we have given, in so far as they bear on this point.

South Carolina is no exception to the rule of general distribution of consumption throughout the world, and especially in temperate latitudes; but it must be added that it is far less common than in

localities further north. We would note here, also, the very frequent occurrence proportionally of this disease among the negro portion of the population. This point has been observed in this city before, and has furnished a topic of discussion, but our attention has been particularly attracted to it of late by our own observations.

We will introduce the statistics of the six years already alluded to, drawn from the same source, to illustrate and verify this statement.

There died of consumption, in the city of Charleston, during the year:—

1866.	
Whites	53
Blacks and colored	75
Total	128
1867.	
Whites	44
Blacks and colored	85
Total	129
1868.	
Whites	47
Blacks and colored	77
Total	124
1869.	
Whites	38
Blacks and colored	94
Total	132
1870.	
Whites	47
Blacks and colored	134
Total	181
1871.	
Whites	53
Blacks and colored	135
Total	188

It appears to us, that, besides the genial character of our climate, there is another reason which operates to confer on us, to a certain extent, immunity from the very common occurrence of pulmonary consumption as it exists in the more northern States. It is this: the severity of our winters is rarely so great as to require the use

of registers, for heating the houses, either by steam or otherwise. Notwithstanding the frequent very cold spells, which occur during our winters, it is very rare to find the houses or even the public buildings heated in this manner. With no double doors and windows, the inhabitants content themselves with such warmth as may be obtained either with stoves, grates, or open fireplaces. In the cities and towns, grates, and in the country districts, the old-fashioned open fireplaces, with the cheerful oak fire, are in use. By this means, the great transition from the dry heated atmosphere of the house to the very intense cold without is not experienced, and the catarrhs and bronchial affections dependent thereon are not so frequently met with.

Measles, scarlatina, hooping-cough, and catarrhal fever have existed at various times during the past year; and in this, up to the present time, but neither in such amount nor so diffused as to entitle them to the term epidemic, except perhaps mumps, since March, 1872. Such cases of scarlatina as have occurred were of the simple variety.

Smallpox, which has laid such a heavy hand upon Philadelphia, New York, and other of our sister cities at the north, has not as yet visited us in anything like an epidemic form. Only a few cases have made their appearance in the entire city of Charleston, and we have received no reports of its existence in the interior portions of the State. These cases have been traced to a passenger by one of the steamers from New York, who developed the disease after his arrival in the city of Charleston, and with him, the individuals who were the subject of the succeeding cases had direct communication. Vaccination and revaccination have been generally employed; the people being willing and anxious to have the operation done, though there is no law to compel them to do so; and they have manifested none of the late fashionable prejudices against it.

We have now to speak of the epidemic of yellow fever which visited the city of Charleston, and to a small extent the town of Beaufort, during the summer of 1871.

Charleston has at various times, and at varying intervals, suffered from the ghastly ravages of yellow fever, frequently and justly denominated pestilence. There is some question as to its first appearance among us, but it is generally assigned to the year 1699 or 1700, when from its fatality it was called the plague. Having once got its foothold, and found a genial atmosphere, it returned

in epidemic form in 1703. In 1728 it again returned, and received the name yellow fever. In 1732 it began to rage as early as May, and continued until September and October. In 1739 it was nearly as violent as in 1732, and was observed to fall most severely on Europeans. In 1745 and 1748, it was less violent. Again, in 1753 and 1755 there were a few cases. Forty-four years elapsed from 1748 before Charleston was again visited with this disease as an epidemic. In 1792 a new era occurred in the history of yellow fever. It raged in that year, in 1794, 1795, 1796, 1797, 1798, 1799, 1800, 1802, 1804, and 1807. In 1803 and 1805 there were a few cases, but in both years the victims did not exceed 59. In 1793 and 1808 the disease is not mentioned, and in 1806 only a few cases occurred. From 1807 to 1817 there are no records of its existence as an epidemic, although there were sporadic cases. In 1817 it prevailed with great malignity. In 1819, in 1824, when it reached Sullivan's Island, in 1827, 1828, 1830, 1838, and 1839, the disease was epidemic. From the last date, a period of nine years, there was no epidemic, and the disease did not appear except, in a few cases, in the suburbs of Charleston in 1841. It is a remarkable fact, deserving of note, that in the last-mentioned year, although cases were carried into the city, the disease did not propagate or spread.

In 1850, break-bone fever existed as a wide-spread epidemic. In the words of Dr. Wragg, in an address to the Medical Society of South Carolina, "Perhaps the annals of medicine will not furnish another instance of such general sickness, and such small mortality" . . . . "seven-tenths or eight-tenths of the people were sick." The small amount of electricity in the atmosphere during this summer was particularly noted.

In 1852, yellow fever was again present, but, though wide spread, many of the cases were very mild, and doubts were entertained of the genuine character of these. In 1853 a few sporadic cases are noted, which did not spread. In 1854 the disease again prevailed very extensively, but the epidemic, like that of 1852, was characterized by a large number of mild cases, as to the genuine character of which the same doubts were entertained. Dr. Dickson, writing of this epidemic in the *Charleston Medical Journal*, said: "The number of persons attacked by fever in the city was wholly beyond precedent, except during the prevalence of influenza, or the invasion of dengue." Dr. Cain spoke of it as "not an epidemic but a pandemic." In 1854 the disease also appeared in Georgetown and Beaufort. 1857 was marked by an appearance of yellow fever at

Mount Pleasant, two and a half miles from Charleston, where it was said never before to have been present, and to a very small extent in the city. In 1858 a severe epidemic visited Charleston, and prevailed on Sullivan's Island; and in 1864, during the war, the disease prevailed to some extent in Charleston. We have been unable, unfortunately, to lay our hands on the only written account of this latter epidemic, but, so far as we can arrive at the facts, it began in the northwest portion of the city, and prevailed in the upper wards, above Calhoun Street, which formerly marked the division between the city proper and the Neck. In 1866 there was a wide-spread epidemic of fever, concerning the nature of which there was much dispute; it resembled the dengue, however, in this much, that the mortality was exceedingly small. It was called dengue, break-bone, relapsing, and sweating fever, after that of the middle ages. It defied classification in any of the groups of writers on fever. It was a wide-spread epidemic, and all classes of the population were attacked, irrespective of age, nativity, or acclimation. We were informed by the late Dr. Wm. C. Holbeck, an accomplished and skilful physician, who had much experience in yellow fever, that he saw, during this epidemic, several cases of well-marked yellow fever with black vomit. It is a matter of regret that no history of this epidemic has been written.

As to the mortality of these epidemics of yellow fever, which have prevailed as above detailed, we have but vague accounts up to the year 1799. In 1732, when the population was about 10,000, it is recorded that at the severest period of the epidemic there died daily from eight to twelve persons.

In 1799 . .	died 299	In 1804 . .	died 148
" 1800 . .	" 184	" 1807 . .	" 162
" 1802 . .	" 96		

The population at these periods was about 20,000.

In 1817 . .	died 270	In 1830 . .	died 31
" 1819 . .	" 176	" 1834 . .	" 49
" 1824 . .	" 231	" 1835 . .	" 24
" 1827 . .	" 62	" 1838 . .	" 353
" 1828 . .	" 26		

The population in the last year was estimated at 30,000.

In 1839 . .	died 133	In 1856 . .	died 206
" 1849 . .	" 123	" 1858 . .	" 680
" 1852 . .	" 280	" 1864 . .	"
" 1854 . .	" 624	" 1871 . .	" 213

This brings us to the year 1871 in the history of yellow fever in its connection with this city. In reviewing this record, we are struck with the irregularity in the visitations of this disease in its epidemic form, and search in vain for anything like system or method. This character of irregularity is as much to be marked in the frequency of its occurrence as in the severity of the disorder, and on a careful study, we are also struck by the increasing mildness of the epidemics since 1824, if we except the years 1838 (when the great fire occurred), 1854, and 1858. We will also remark the frequent occurrence (almost in alternation) of epidemics of break-bone or dengue, with those of yellow fever since 1849; and again the large proportion of mild cases to the severe, in the various epidemics from 1839 to the present time, as compared with the epidemics of preceding years, is also a matter of note.

It will be observed that the disease is mentioned as sporadic in many of the years which made the intervals of its epidemic attack.

In 1871 this much dreaded malady again laid its hand upon the city of Charleston. It weighed down the energy which was manifested in her repair, improvements, and elevation from her disasters; clenched its remorseless fingers around her sources of prosperity; closed up her avenues of commerce; and brought desolation and mourning to the homes of her people. It marked a new era in quarantine, and, by land quarantine as well as that by sea, ostracized and debarred her from communication even with her sister cities.

The health of Charleston had been unusually good during the spring and early summer of 1871; indeed, to so great an extent, that it was the subject of general remark among the people, who congratulated themselves upon this favorable disposition of Providence. But they were unhappily soon awakened from their state of security, and deprived of this source of self-congratulation, by the appearance in their very midst, without warning from without, of their old and dreaded enemy. Difficult as it was to relinquish the hope of a continuing healthful state, the profession was obliged to admit the genuine character of the disease which presented itself to their observation.

On the 19th of July the first case was seen. As this case has been disputed, we give the notes furnished us by Dr. Jno. L. Ancrum, who was in attendance. "Lizzie Clark, Irish, aged 31, No. 10 Chalmers Street, twenty years in Charleston, but had travelled about a great deal, and had never had yellow fever, was first seen

on the evening of 19th July. High fever, pain in head and back, tongue furred. 20th. Had a restless night, fever unabated, eyes suffused, urine pale and scanty. 21st. Delirious last night, vomits all ingesta, passed little or no urine, eyes much injected and slightly tinged with yellow. 22d. Partial collapse, wild delirium, black vomit in large quantity. 23d. Collapse complete, still vomiting, but not so frequently, suppression of urine complete. 24th. Comatose, icteric hue intense. 25th. Died early this morning.

"These notes are given partially from memory, the essential parts from note-book." The certificate was given for "Icterus."

On the 29th of July the first undisputed case developed itself in the person of a German, Wagner by name, who was employed and resided at Mr. Claussen's steam bakery in Market St. between Anson and East Bay Sts., a distance of two squares to the north and two to the east of Chalmers St. This man was attacked on the 29th of July, and admitted into the City Hospital at 9 A. M. on the 3d August. At 9 P. M. vomited copiously black vomit, and died on the same evening, his body tinged yellow.

August 6th. Jas. Maloney, an Irishman, aged 24, a clerk who had resided in Charleston twenty months, was attacked in the evening, at No 37 Market St., and died on the 11th August.

August 10th. A female child aged 4, native, residing in Market St. opposite Mr. Claussen's bakery, was attacked, but was convalescent on the 25th.

August 11th. A German who was employed and resided at Mr. Claussen's bakery was attacked; he was removed to the corner of George and Meeting Sts., where he died on the 16th, having vomited black vomit.

On the same day, August 11th, Mary Morumy, an Irish girl aged 21, who had resided in Charleston two years and six months, was attacked at her residence in Beaufain St. opposite Archdale four squares west and one square north of Claussen's bakery, and died on the 15th with black vomit.

August 16. Mrs. W., Irish, two years in Charleston, residing at the same place as Morumy, was attacked; she did not vomit black vomit, and recovered.

August 17. A Canadian residing at No. 8 Beaufain St. was attacked and died on 24th with black vomit.

On same day two cases were reported on East Bay near Market St.

August 18th. One case reported in Market St., one case at No. 10 Anson Street. August 19th, one case on East Bay near Market St.

20th. One case Market near Anson, one case in Market St. between King and Archdale Sts.

21st. One case at the corner of Franklin and Queen Sts., one in the southwest portion of the city, one case in Beaufain St., one at Claussen's, one in Market near Anson St., one No. 11 Anson St.

22d. One case in King St. above Queen.

23d. One case in Stolls Alley in southeast portion of the city. This patient had worked at the new Custom House at the foot of Market St. on Cooper River.

24th. Two cases in Coming St. opposite George St. three squares north and two squares west of Beaufain St., one case corner Market and Meeting Sts., one case corner of Hasel and Meeting Sts., one case in Chalmers St.

These cases were reported at an extra meeting of the Medical Society of South Carolina held for the purpose, and were transcribed by our own hands as secretary of the society.

Without further relating cases, we will trace the disease from its point of departure, and note its course as it developed itself over the city.

It will be observed that the disease extended itself first westwardly, and from its first step distributed itself in all directions. It travelled up Meeting St., where we hear of it at the corner of Hasel St.; down Meeting, where we hear of it in Chalmers St.; westwardly, at the corner of Franklin and Queen; northwest, in Coming opposite George. On the 24th of August deaths were reported in Lambal St. in the extreme southwest portion of the city, on the 26th, and in Philadelphia St. in the southeast on the same date. From this period, the disease burst upon the entire lower portion of the city from Calhoun St. to its southern extremity. On the 31st of August, the first death was reported above Calhoun St. in Vanderhorst, and again September 3d a death was reported in Spring St., thus showing that in three days the disease had made a jump of five squares.

It will be seen from this statement that the disease pursued an erratic course from its point of starting, following no direct line, nor did it step from house to house, summoning their occupants to submit to its power, but leaped about in different directions, and made its appearance in various localities of the city at the same time, as if uncertain where to reap the rich harvest which lay open to it. It must be admitted, however, that, in the beginning of its career, Market Street was its favorite point of attack, and this pro-

clivity it maintained during its prevalence in the lower wards. Claussen's, the place of its birth, furnished five victims during the epidemic; indeed so marked was its violence at this point that we note the fact here, in order that in our inquiry into the cause of its origin we may bear it in mind. The epidemic tendency continued from seventy-five to ninety days.

The number of deaths was 213. The nativities of the victims were as follows:—

United States.

Alabama	2	Ohio	1
Connecticut	2	Pennsylvania	2
Georgia	4	Virginia	3
Indiana	1	Louisiana	1
Massachusetts	1	Maine	2
New Jersey	2	South Carolina	40
New York	6	Charleston	41
North Carolina	2	District of Columbia	1

Foreigners.

Canada	2	Scotland	1
England	5	Bohemia	1
Spain	1	Bavaria	1
Italy	2	Poland	6
France	1	Germany	62
Ireland	17	Sweden	1
Denmark	1		

It will be observed that the number of deaths of natives of Charleston is large in proportion to those of foreigners and natives of South Carolina and other States of the United States. This strikes us particularly, as in former epidemics it was generally the case that native adults who had resided always in the city of Charleston were as a rule exempt from attacks of yellow fever.

This subject, therefore, claims our attention, and is worthy of an investigation. During a large portion of the war, the city to the extent of more than half was uninhabitable, and uninhabited by the people by reason of its being under fire of shells. A large part of the people were, therefore, obliged to seek safety for their families in the interior of the State. During this time and the period before their return to their homes, many children were born and were consequently unacclimated, and hence as fit subjects for yellow fever as foreigners. Again, a very large portion of the male population were in the armies, which took them out of their native atmosphere. If the point is conceded, that acclimation once

obtained can be lost by removal for the period of four years, this class also afforded fit food for the epidemic.

Another point to be investigated is, the large proportion of the German population, to whom the disease came in a fatal form, as compared with that of other nationalities. The solution of this may be found in the fact, that in the last five years our increase of population from foreign sources has been by an accession of Germans almost exclusively. To this, and not to any peculiar susceptibility on the part of the German to the poison of yellow fever, is to be assigned this disproportion of mortality.

In the earlier epidemics of yellow fever in Charleston, the negro population enjoyed a peculiar immunity.

In the year 1802 there was not a single death among the blacks, and only one mulatto died of the disease. In subsequent years they were not so fortunate. Dr. H. W. DeSaussure, in his "Report of the Meteorological and Sanitary condition of Charleston for the years 1857–58," read before the Medical Society of South Carolina, remarks: "A marked feature of the epidemic of this year [1858] was its proclivity to attack the colored and black population. This tendency was somewhat developed in 1854, but acquired a great increase during the present season, and the deaths among this class of population were more than double those of 1854. The mortality was very small, however, in proportion to the number attacked." This tendency was continued in the epidemic in 1871. There died 23 black and colored; and the same remark may be made, in relation to the proportionate mortality to the number attacked, as in 1858.

The fevers of the epidemic of 1871 presented themselves under forms so different as, in the opinion of many, to warrant a distinction between them. They may be divided into two classes, according to their course and groupings of symptoms.

I. Yellow fever proper, and II. an ~~epidemic~~ Ephemeral form of fever, by some denominated break-bone.

I. The first, as the most severe, fatal, and typical, deserves the first mention. Yellow fever has been so graphically painted by the able pens of LaRoche and others, that we will content ourselves with a simple narrative of those symptoms and groupings of symptoms most frequently manifested in the epidemic, which forms the subject of our present consideration.

The invasion was usually sudden, though occasionally prodromic symptoms gave warning of its approach; these prodromata, when

present, differing in no material point from those of the continued fevers. A chill generally announced the onset, or frequently, in the absence of this, its place was supplied by sensations of chilliness, immediately followed by pain in the head, back, and limbs, which was often exceedingly severe. Nausea with vomiting of the contents of the stomach, and afterwards of biliary matter, frequently accompanied this stage. The chill or chilly sensation rarely endured any length of time, and was followed by fever. The skin, usually intensely hot to the touch, was in most cases dry, but not invariably so, as sweating was sometimes present, though it did not abate the feeling of heat. The pulse was frequent, ranging, however, from 100 to 120 or more in the minute; its character varying in different cases according to the habit of the patient under observation. The pain in the head, back, and limbs increased in this stage, and formed one of the most distressing symptoms. The headache was intense, usually frontal, though its location was not invariably in this point, but extended to the orbits and globes of the eyes. The face was usually flushed, though not always, this symptom varying in different cases. The eyes were red and injected, having the appearance so well described as like that produced by smoke. A watery character was not invariable, and the dry glassy eye could be occasionally seen.

The circulation, at first active in the capillaries, as the disease advanced became sluggish, giving a dusky appearance; the blood returning slowly after pressure from the vessels. With the advance of this stage, these symptoms became intensified, and the pains already noted became very severe and tormenting, especially that in the back and head, and, as a result, jactitation and restlessness were added, accompanied by moans. Delirium and restlessness characterized the nights, but the former symptom was not present in all cases. Thirst was frequently complained of as an annoying accompaniment of this open febrile stage. Inward heat and pain on pressure, in many cases, over the epigastric region, with irritability of the stomach, were present. The duration of this stage varied from twelve to seventy-two hours or longer, and generally it passed off suddenly. In fatal cases the termination seldom occurred at this time.

At the end of the period stated, the distressing symptoms became ameliorated: pain ceased or was much mitigated, the skin cooled to the touch, the pulse diminished in frequency. But this calm was generally only a lull preceding the storm which was to break upon

the patient, in many instances to overwhelm him. The stomach became more irritable than in the preceding stage, everything was rejected and medicine had to be omitted. The matters vomited consisted of mucous or watery fluid, at first clear, but further on, when settled, depositing grayish or black specks with great aptitude likened to snuff or grounds of coffee. This vomit was but the harbinger of the approach of the ominous black vomit, with reason dreaded. The skin lost the flush which it had in the previous stage, and assumed a deeper or livid hue, and collapse was marked, constituting the second stage.

The brain and nervous system were often engaged in this stage, manifested by delirium or sluggishness of intellect. Many cases terminated here with the life of the patient; others passed into the third stage, marked by many of the symptoms of the second, but with others superadded, indicative of the disorganizing blood change which was progressing. The vomited matter became blacker, greater in quantity, and easily ejected.

The capillary circulation diminished in activity in the earlier portion of the disease, rapidly became more sluggish, and a very fatal symptom was manifested, suppression of urine. The eyes and skin assumed the yellow hue which has given the name to the disease, in some cases becoming dark. Occasionally, hemorrhages were added to the already fearful scene, which was closed, in most cases that reached this point, by death.

We are informed that a few cases of the algid form were seen during the epidemic. In some cases, the subjects of which had been addicted to excessive drinking, the disease ran its course very rapidly, the several stages being run into each other, the symptoms bearing on their face their fatal character in the inception.

Albumen early appeared in the urine, in most of the severe, well marked cases having been observed as early as the second day. In fact it was almost a constant symptom. Black vomit occurred in a large number of cases, but it must be observed here, that in this epidemic a number of cases, especially in children, in which this symptom was manifested, finally recovered. Suppression of urine was seen in a very large proportion of the fatal cases, and was regarded as a most ominous sign, betokening the fatal termination of the cases in which it occurred.

We annex thermometric records of several cases of this form of fever.

Thos. Fox (Irish), 7 months in Charleston; malignant case. Admitted into City Hospital, August 21.

Date of Disease.	Month.	Temperature. 9 A. M.	5 P. M.	10 P. M.	Pulse. Morn.	Noon.	Eve.	Respiration. Morn.	Noon.	Eve.
1	August 21									
2	" 22	105 noon	106	106.5						
3	" 23	105.5 9 A.M.	105	104						
4	" 24	104	103.5	100.5						
5	" 25	102	100.5	101.5						
6	" 26	died								

Black vomit on fifth day of disease.

Albumen in urine on day of admission.

Segin Sabbath (Poland), 7 months in Charleston; gravior. City Hospital.

Date of Disease.	Month.	Temperature. 9 A. M.	5 P. M.	10 P. M.	Pulse. Morn.	Noon.	Eve.	Respiration. Morn.	Noon.	Eve.
1										
2		105.5 1 P.M.	105.5	105						
3		105 9 A.M.	105	105.5						
4		102	...	102.5						
5		102	102.5	102						
6		102.5	102	101						
7		100	100	100						

Black vomit on fifth day of disease; albumen in urine on third day of disease. Died, on fourteenth day of sickness, of "septicæmia."

Wm. R. D., native, unacclimated, 22 years; gravior; recovered.

Disease.	Date of Month.	Temperature. Morn.	Noon.	Eve.	Pulse. Morn.	Noon.	Eve.	Respiration. Morn.	Noon.	Eve.
1	Sept. 23	...	...	104.2	...	...	110	...	...	22
2	" 24	100	100.8	101	104	92	92	24	20	20
3	" 25	102.8	103.2	R.[2]	88	86	...	22		
4	" 26	101.2	100.2	102	72	60	64			
5	" 27	100	99.5	100	64	68	64			
6	" 28	99.5	S.[1]	98.7	60	...	52			
7	" 29	98.5	99.2	99	52	56	52			
8	" 30	98.4	98.4	99	60	56	60			
9	Oct. 1	...	...	...	56	56				

[1] Sweating; no observation was taken.

[2] Refrigeration having reduced temperature, no observation was taken.

Jos B., native, unacclimated, 25 years old; mitior; recovered.

Date of		Temperature.			Pulse.			Respiration.		
Disease.	Month.	Morn.	Noon.	Eve.	Morn.	Noon.	Eve.	Morn.	Noon.	Eve.
1	Sept. 25	...	...	102.2	...	...	96			
2	" 26	100.8	...	100.4	96	...	88	20	...	20
3	" 27	98.4	98.2	98.4	72	72	68			
4	" 28	98.4	...	98.4	72	...	72			
5	" 29	98.9	...	99.5	72	...	72			
6	" 30	98	...	76	...					
7	Oct. 1	98	...	...	68					

Our thermometric records are too few to permit us to hazard an assertion, but we are prepared to admit that the febrile movement of yellow fever is characterized by remissions in an eighth hour cycle. In making this statement, we desire to be distinctly understood, as not intending to confound remittent fever due to malaria, with specific yellow fever.

In the second or stage of calm, though the skin may return to the normal or go below, in its temperature, this remains high, in most cases, falling somewhat in certain instances at the time of the occurrence of black vomit. This will be observed particularly in chart number 1.

There were noted as sequelæ of the yellow fever, in one case, parotiditis, and in a number of cases a form of entero-colitis, characterized by dysenteric discharges, which continued a variable period after the disappearance of the symptoms of yellow fever, and rendered the convalescence tedious. We have also been informed of the occurrence in two cases of gangrene of the scrotum and penis.

This type of fever attacked principally foreigners and those residents of the city who had but recently made it their home, having come from colder and more northern regions. Those natives, who were the subjects of its attack, were generally children under eleven years; the youngest whose death is reported being three months. But seven deaths were recorded of adult natives; these were aged 15 years 6 months, 18, 19, 22, 25, 31, 34.

The case reported as having died at thirty-one years was Lizzie Clark, whose case was the first of the epidemic. She had resided twenty years in the city, but had travelled about, during this period, a great deal from place to place, returning at intervals to

the city of Charleston. The death at thirty-four was of a gentleman who spent nearly every summer on the sea islands, and could not be considered as acclimated. That at twenty-five was of a gentleman who, though recorded as a native, had lived but five years in Charleston. The death at fifteen years and six months was of a young lady who had resided but five years in the city, and that at twenty-two was of a young man who had resided twenty years in the city.

It will be observed, that by far the most part of the natives who died were either children under eleven years, adolescents, unacclimated adults, or those who having been acclimated lost this protection by absence from their native place.

II. Ephemeral Fever, or, as denominated by some, Febricula, or "Break Bone." This fever consisted of a febrile paroxysm lasting from twelve to forty-eight hours. It was ushered in occasionally by a chill, generally simply by the shivering or alternate flushings and chilly sensations common to the beginning of fevers, followed by febrile reaction, pain in the head and limbs, occasionally severe. The skin was hot, pulse frequent, generally full; the tongue was furred, sometimes almost natural in appearance. Nausea and vomiting were occasionally present but not constantly; the eyes were clear and devoid in most instances of the red watery character which was displayed in the form described above. At the end of the period varying from twelve to forty-eight hours, generally twenty-four, the fever abated, and the patient entered upon convalescence, without any symptoms which would indicate the second stage of yellow fever.

We must remark, that, in some cases, in the advanced period of the epidemic, it was impossible to arrive at any judgment as to the course which would be assumed by the case under observation. In cases even where the paroxysm was severe, the patient would, at the termination of the fever, enter immediately upon convalescence at the end of eighteen or twenty-four hours. Again, instances occurred in which cases at first mild passed into the most severe and malignant form of well-marked, typical yellow fever.

This fever differed in the large majority of cases in no essential particular from ordinary febricula, and was in many instances reported as such to the Medical Society, during the existence of the epidemic, while the typical yellow fever was present in all its majesty. It respected no bounds, and attacked native as well as foreigner, but was mild in character, no fatal case having been re-

ported as resulting from it, where the forms were distinguished in the report. The two forms went hand in hand, visited together, and the two diseases could be seen claiming their subjects in the same house and even in the same bed.

Previous attacks of well-marked yellow fever in former epidemics, as well as acclimation, afforded but feeble barriers to the attack of the ephemeral fever. Natives who in former epidemics had well-marked yellow fever, were just as well subjects for it as the native adolescent or the adopted citizen. As one of a number of instances of this peculiarity may be mentioned the case of a German who had suffered from yellow fever in Havana, had been in Charleston through other epidemics with impunity, but did not escape an attack of this ephemeral fever. It frequently preceded the yellow fever, leaving the subject of its attack still to suffer from the inroad of its more powerful and dangerous companion. Instances of this kind were too numerous to be considered simply as coincidences. By way of illustration we will introduce a few instances.

Jno. Williams, born on Long Island, New York, a sailor, was admitted into the City Hospital, October 15, with "ephemeral fever," and was discharged cured on October 23. Readmitted on October 30, with yellow fever well marked, and died with black vomit November 3. This case is taken from the hospital case-book.

Mr. E. H. C., born in Walhalla, South Carolina, resided in Charleston seven years, employed in the office of Mr. Claussen's Bakery, Market Street, was attacked with a mild form of fever on September 1, recovered, and was well enough to attend to his business. At the end of fourteen days, he was attacked with yellow fever and died.

We have reports of two other cases in which, a month after attacks of ephemeral fever, the subjects had severe typical yellow fever.

The following are taken from the books of the Medical Society of South Carolina.

"One case was that of a mulatto woman, aged 30 years, a native, who had been away for the summers during twelve or thirteen years. In September she had an attack of ephemeral fever, which lasted thirty-six hours; she recovered, and at the end of two weeks she had a second attack of fever, which ran the course and pre-

sented the symptoms of yellow fever, from which she also recovered."

"A German, who had been in this country eighteen months, was attacked with the 'prevailing fever' comparatively severely; gums were touched with mercury. The patient remained well for a month, and is now suffering from an identical attack."

These instances might be cited to a much greater length, but we deem these sufficient to establish the point. We append a chart showing the range of the thermometer in a mild case.

Meta A. A., native, 5 years 1 month; mild ephemeral; recovered.

Date of			Temperature.			Pulse.			Respiration.		
Disease.	Month.		Morn.	Noon.	Eve.	Morn.	Noon.	Eve.	Morn.	Noon.	Eve.
1	Aug.	31	...		102.8						
2	Sept.	1	102.3		102.1						
3	"	2	97.5		97.2						
4	"	3	97.5								
5	"	4	98.5								
6	"	5	98.5								

Between these classes of well-marked typical yellow fever and the ephemeral fever, there were cases which occupied a middle ground, exhibiting the pointed tongue with white coat and red edges and tip, and in which the stomach asserted in a more pronounced manner its part in the disease than in the mild form.

Proportional Mortality.—It is a difficult matter to arrive at an estimate of the proportion of fatal cases of fever to the number of cases which were seen during the epidemic. This difficulty arises from several sources.

Hospital statistics, which are generally employed as the means of information, avail us nothing on this occasion. Most of the cases treated in hospital are seldom admitted on the first day of the disease, and oftener later than the second. Under such circumstances, the death-rate must necessarily be very high, as the good results of treatment could not be expected when the most important time for its employment had passed before the patients came under observation. Mild cases were seldom under observation, for the reason that the majority terminated within the first twenty-four hours. Calculations based upon such statistics would, for obvious reasons, give but an unfair estimate of the general proportion of mortality.

We have, therefore, been obliged to resort to the results of private practice for the materials necessary; but even here we are met by another source of error, which arises from the different views as to classification entertained by different practitioners. Many made no distinction between the fevers, but classed them all under the head of the "Prevailing Fever;" under these circumstances the results of their work must show greater success than that of those who were more strict in their classification.

Of 1177 cases of all types and phases of fever met with during the epidemic, selected only for the accuracy with which they were recorded, there were 43 deaths or .036 per cent. This statement demonstrates clearly the mild character of the epidemic, the mortality of which will compare favorably with that of measles, and offers a record much better than that of smallpox or scarlatina.

Of 585 cases of fever, noted as "ephemeral or break-bone," there was not a single death. In 300 cases of fever, 75 were noted as yellow fever; of these 75, 15 died, or 20 per cent. In 484 cases, 124 were noted as yellow fever; of these 124 cases, 7 died, or 5½ per cent. Of 20 cases noted as yellow fever, 8 died, or 40 per cent. In 43 cases of fever, noted as yellow fever, under the liberal classification, 1 died, or a little over 2 per cent.

It will be observed, therefore, that the mortality of the yellow fever varied, according to the views (as to classification) of the individual observer, from 2 per cent. to 40 per cent. In noting the mild character of the epidemic, we do not wish to convey the idea that the cases which were well marked as yellow fever were peculiarly mild in character, or that the disease presented itself in a form different from that which we have before known.

Many of the cases were exceedingly malignant, especially in those instances where its subjects as strangers afforded a field for its unrestricted action. The number of light cases of fever gave to the epidemic those features which entitle it to the term. The number of people who were sick with fever during the season was very great, although the mortality, as already shown, as estimated in relation to the number of cases considered without distinction of type, was very small. The field of operation for yellow fever was much diminished by the departure from the city of many of those who were or considered themselves subject to its attack. It is said that people to the number of 5000 left the city within two weeks.

Treatment.—As to the treatment, we have but little to say. No heroic plans were adopted or countenanced. In the early period of the disease a mercurial cathartic generally began the treatment, followed by a saline. On the occurrence of irritability of stomach, all efforts were directed to its relief or amelioration. For this purpose, such agents were used as corresponded to the views, or were in accordance with the special inclination of the individual practitioner. For our part we relied upon milk, ice, and lime-water, and were satisfied with the results obtained. Stimulants were used in the latter stages as they appeared to be necessary. In the febrile paroxysm, cold sponging, the wet sheets, and other methods of refrigeration were employed, with marked diminution in the temperature, and to the great comfort and relief of the patient. The sulpho-carbolates were used, but the results obtained were not such as to demonstrate any peculiarly beneficial effect. Blair's treatment, by twenty grains of calomel and twenty-four of quinine, was tried, but did not claim many strong adherents; indeed, the employment of quinine was not much in favor. We are informed from many sources (which coincided with our own experience) that the effect upon the nervous system, especially the brain, was in a number of instances very unfavorable. We tried this method in one instance, but were so much dissatisfied with the effect that it was not repeated in any others. No estimate could be put upon the power to abort the attack claimed by Dr. Blair for his method, for many more cases of fever terminated at the end of eighteen or twenty-four hours, without such treatment as he recommended, than did with it.

During the prevalence of the epidemic, there were reported, at the meetings of the medical society, cases of mumps and chicken-pox. Ephemeral fever was reported as present in July.

Absurd as it may appear at the present period, when diseases are studied with the light of experience gained by time, and clinical observations are so carefully made, the question must be raised, "What constitutes yellow fever?" With the impressions of an epidemic of this disease and the results of its fatal effect fresh upon our minds, and its ravages but a few months at an end, the profession of Charleston are divided in opinion upon this point.

A well-marked typical case, with its stages, formidable array of symptoms, its fearful black vomit, passive hemorrhages, and yellow skin, presents a picture which, once seen, makes its indelible impression upon the mind. It is not this class of cases, unmis-

takable and impressive, which causes difficulty in diagnosis; its reality is too fearfully marked, and its features too fatally characteristic, to admit of hesitation. The so-called phases and variations of type, however, are far from plain, and it is the recognition of these, as identical with the typical cases, that has brought about the complexity which now invests the subject. This admission had been productive not only of disappointment and loss of faith in the teachings of former experience, but in many instances the sacrifice of life, by reason of confidence based upon the immunity supposed to have been conferred by attacks of those modified forms of yellow fever which have been classed in the same category as the disease to which the term was originally applied.

No one can review the mass of literature of yellow fever, and not be impressed with the necessity of studying each epidemic of fever, by itself and in its relations to the peculiarities of the locality in which it occurs. With this view, we have been induced to make a distinction between the two predominant forms of fever met with in the epidemic which forms the subject of our consideration. In doing this, we are not ignorant of the terms of compassion in which Rush speaks of those physicians who, in the epidemic that visited Philadelphia in 1793, were guilty of recognizing in the "tertian" and "quartan" types (during the intervals of the attacks of which the patients were able "to go abroad") "as many diseases as the yellow fever had symptoms." In so doing, we have not lost sight of the number of phases and variations of type attributed to yellow fever, by those who have described epidemics and written on the subject; and the extensive latitude allowed to this disease beyond all others for its manifestations.

The results of our own observations have induced us to distinguish the ephemeral form of fever from the typical yellow fever; although we are aware that this opinion is not without opponents even in our own community. Veitch, in his letter to the commissioners for transports and sick and wounded seamen, published in London in 1818, uses the following expression: "The confounding the remittent fever with the ardent fever of strangers in a tropical climate is not the result of the difference between them passing unobserved, but it often arises from an injurious tendency to generalize."

By this system of generalization, during the presence of yellow

fever, especially in those places where it does not occur epidemically, except at intervals, all forms of fever are assigned to its influence, irrespective of symptoms or the grouping of them. This is demonstrated by a statement made by Mr. Blair in his accounts of the epidemics of Georgetown which occurred during 1837 and subsequent years. He notes three forms of yellow fever, Gravior, Mitior, and Simplex, but remarks, "the simplex form was not distinctly recognized till 1841." It is natural to suppose, that, if this simplex or "ephemeral form" of fever had presented the characteristics of yellow fever, it would not for nearly five years have escaped the vigilance of so acute an observer as Dr. Blair.

Under the influence of the dogma, that the presence of one disease of power drives away all others before it, we have departed step by step, and little by little, from the original type of the yellow fever, until now, under this pressure, it is not even necessary that fever should be present, or that the individual should be confined to the house, who is supposed to be laboring under the disease that was considered to be as malignant and fatal as the plague, with which it has been confounded.

Rush included in his 3d class, "those in whom the miasmata acted so feebly as not to confine them to their beds or houses." Gillkrest, who, in the *Cyclopedia of Practical Medicine*, gives an admirable sketch of the history of yellow fever, says: "From what has been said, it must be evident that great difficulties stand in the way of affixing pathognomonic symptoms to yellow fever; it has even been observed that those very slight attacks which occur not unfrequently during epidemics, and in which we have not a single well-marked symptom of fever, seem to give the admitted degree of immunity during subsequent epidemics."

Should we accept this classification, yellow fever, justly considered as most fatal and malignant in its true type, fades off into health so imperceptibly that it is impossible to draw the line of demarcation where the one ceases and the other begins.

Yellow fever, which in the early history of Charleston is described as so fatal on its first appearance in 1699 or 1700 as to have given it the appellation of "the plague," in this and subsequent years sweeping off the population by families, and claiming as its share three-fourths to one-sixth of all those whom it selected for its attack, in 1871 prevailed with a mortality of .036 per cent. Under this view, one by one the landmarks have been removed from the history of yellow fever. One attack, which

was formerly supposed to give immunity from another with rare exceptions, now provides no barrier to a repetition—nay, to attacks with each appearance of the disease. In illustration of this point, we will introduce the following: Dr. Thomas, in his treatise on yellow fever, as observed at New Orleans; Paris, 1848, Review, *Charleston Medical Journal*, states, that three varieties of yellow fever were admitted in a report to the medical society, an attack of either of which was sufficient to give immunity from second attacks. In the first variety, the symptoms of the first stage alone existed, and the case then terminated in convalescence. In the second, besides the symptoms of the first stage, more or less of the symptoms of the second and third stages were present, the greater proportion of these recovering. In the third variety, the symptoms of all three stages existed in great severity, or else the disease ran its course so rapidly that the stages were indistinguishable. He did not admit the first class as genuine cases of yellow fever, since they did not give immunity from subsequent attack; cases having come under his personal observation, of individuals contracting yellow fever years after undergoing attacks of the first variety, although continual residents of New Orleans. His definition of yellow fever is, a disease which, besides symptoms of the first period, presents some of those characteristics of the second. Those cases of fever in which the symptoms of the first stage were alone present, he considered simple inflammatory fever.

Dr. Blair states, that, "although the inhabitants of Georgetown who passed through the late epidemic had resided there during the epidemic of 1819, there was no instance of a sufferer from the epidemic of 1819 being attacked." That those who suffered from fever in the epidemics which he describes, after the ephemeral form was detected, were not so fortunate, we may infer from the following quotation from his book: "The disease, however, was frequently baffled, and returned; and the liability to a return was in proportion to the mildness or shortness of the previous attack."

Adult natives of localities in which yellow fever frequently appears, who were considered as inured to the disease, now experience attacks of the ephemeral type as readily as the latest arrived immigrant takes the typical disease. In addition to this, the epidemic of 1871 has demonstrated (if this classification be correct) that one attack of mild form of so called yellow fever, so far from protecting, leaves the individual subject, at the end of a time varying from a week to a month, to another attack, during the

same epidemic, and in strangers almost invariably of the severe form in which, in many cases, to lose life.

With these reflections, we venture to make a discrimination between the fevers which came under our observation during the last summer.

"The disease which forms the subject of our present inquiries does not vary in regard to its pathognomonic phenomena in whatever region or at whatever period in the same place it may show itself sporadically or in epidemic form." (La Roche.) This acknowledgment concedes to yellow fever a type of its own, by which its individuality, and claims to consideration as a special and specific disease, have been established. This type, though not invariably manifested by the same symptoms, still has always and in all localities been marked by such combinations, and groupings of phenomena, as to designate its true character. Like all other diseases, yellow fever assumes different aspects at different periods by the predominance of certain symptoms, or the absence of others, which have at other times been present in a more pronounced degree. Yet, even under these circumstances, the links which bind these symptoms and phenomena in the chain of morbid sequence, have been sufficiently strong to keep up the characters peculiar to it.

The epidemic under our consideration offered no exception to this rule. The disease manifested itself with its usual variations, still, however, clothed in its usual "livery." The pronounced cases differed in no way from those, which have characterized other epidemics; its predilections remained the same, and its features were sufficiently familiar to make its recognition prompt.

"The discrimination between yellow fever and other febrile complaints is a subject which under ordinary circumstances can prove of little difficulty to a physician familiar with the pathognomonic phenomena of the disease, and of those with which it is contrasted." (La Roche). The truth of this statement cannot be doubted with the premises required; remove the factor of ordinary circumstances, and the nature of things changes, though the other factors remain the same.

The epidemic of 1871 did not occur under ordinary circumstances, and the difficulty of discriminating the forms of fever which we have already described was great, so great, indeed, as to divide in opinion physicians very "familiar" with the "pathognomonic phenomena" of yellow fever. "In yellow fever, as in every

febrile complaint, there is an assemblage of phenomena which enables the experienced observer to ascertain its nature and discern its relations to other disorders." In an epidemic of yellow fever, when there is present a fever which is not possessed of this assemblage of phenomena, which runs its course at the same time as the well-known disease, and appears in some instances wearing its "livery," there is a difficulty which even the most experienced cannot remove in a manner universally satisfactory. Such a complication the ephemeral or break-bone fever brought about during the last year, and so remarkable was its course and behavior, that we deem it fit to bring it to your attention. It has been well said by Dr. Nott, that if a physician were called in the forming stage of a number of cases of plague, smallpox, yellow fever, some forms of typhus, and other diseases, arising from morbid poisons, as well as certain vegetable poisons, he would be much at a loss how to distinguish them for two or three days, and in some of those in which the characteristic signs are never developed, as smallpox without eruption, etc., a diagnosis never could be made. Let us apply this as a test to the ephemeral form of fever. In the large majority of cases, the disease terminated in eighteen to twenty-four hours, having manifested no symptoms, which would establish the family resemblance to yellow fever; hence, were its diagnosis as yellow fever dependent upon a linking of the febrile paroxysm with the subsequent stages described as characteristic of that disease, there would have been a failure to point out the likeness in the large proportion of cases. It is admitted, even by those who contend most warmly for the unity of the two forms of fever, that it would have been impossible to diagnosticate this ephemeral fever as yellow fever in the absence of its well-marked and typical companion. In illustration of this, we will mention that physicians of well-known acuteness of observation, who now hold the opinion that these fevers are one and the same, reported cases of the mild form of fever as ephemeral fever or febricula; called attention to the clear eyes, to the character of the headache, and clean tongue, and expressed the belief, that they were due to common causes, and had no analogy to yellow fever; and this, too, in the presence of typical yellow fever.

It must be admitted, then, that the break-bone or ephemeral fever was permitted by courtesy to a classification with yellow fever, and not by a recognition in its individual characters of sufficient claims to that position. Here, therefore, we have not to

deal with facts but theories; not with the symptoms, clinical history, and course of disease, but with philosophical speculations as to the causes of the diseases of which we are treating; namely, that, as other diseases manifest themselves in mild forms, so must also yellow fever; though in those mild forms it loses its likeness to the original stock. The true way, therefore, to carry on our investigation into the claims of these fevers to be considered separately, is to inquire into the behavior of this ephemeral yellow, or "prevailing fever," as compared with those epidemics not accompanied with such a wide-spread and extensively prevailing accompanying fever as in the epidemic under consideration.

Dr. Ramsay, in his *Medical History of South Carolina*, said of yellow fever, "with a very few exceptions, chiefly children, it exclusively fell on strangers." So marked was the exemption of natives from the disease, that it was denominated the "stranger's fever."

It is a generally admitted fact, that those persons who have lived in localities subject to frequent occurrence of yellow fever become inured to the climate, and enjoy immunity from the disease.

"With these facts before us, we are better prepared to understand, that, in places where the yellow fever is endemic, where the climate is continuously warm, and the causes of the disease are more or less permanent or frequently evolved, individuals accustomed by long residence to the influence of that climate, and the agency of those causes, lose their susceptibility to an attack. They become acclimatized or creolized, and are henceforward placed beyond the reach of danger." (La Roche.) Strangers, however, especially those from cold climates, afford to the disease its favorite food, and such but rarely escape attack on going into regions where the disease exists. Natives, also, lose their immunity, after residing for a lengthy period in cold regions. It is admitted, generally, that there are those who are privileged, and others who are susceptible to the disease, and such has been the experience in this city, in previous epidemics, with few exceptions.

In 1852, the proportion of persons, natives, attacked was greater than in former epidemics, but here, too, the question of an intermingling of break-bone was entertained. Native children have been those who have suffered from yellow fever in epidemics of previous years, and, as we have already shown, this obtained in the last.

The ephemeral form of fever of 1871 did not respect these limits,

which by experience have been considered laws with but limited exceptions. It attacked adult natives as well as children, and the foreigner and unacclimated as often as the native. Immunity is even claimed to be conferred by those very mild fevers, which are called seasoning. Be this as it may, the immunity said to be conferred by one attack of yellow fever has been compared to that enjoyed after an attack of smallpox. To this, as to other rules, exceptions occur; but the opinion is very generally held by authors. This claimed immunity has no protection against the mild form of fever we have described; nay, so numerous are the instances in which an attack of ephemeral grade was followed by a severe attack of yellow fever in foreigners, that they cannot be considered as simple coincidences. In some of these cases the last attack terminated the existence of the subject. The intervals by which these two attacks were separated, varied from one week to a month. Dr. Blair says of second attacks, "neither do I believe there is an instance of a second complete attack after a month's perfect restoration to health." The subjects of two attacks in the epidemic of 1871 were well enough during the interval to attend to their business; the second attacks cannot therefore justly be called relapses. Those who contend for the unity of the two forms of fever, and classify all as grades under the same head, account for these second attacks on the supposition that the first was due to a small dose of poison, the second to a larger. Such may be the true explanation, but the assertion is one which can be neither proved nor disproved by facts. It would appear to us, however, after a consideration of the facts stated in respect to the liability of a foreigner to be attacked with yellow fever in the locality of this disease, that this explanation cannot be admitted. In view of the fact that immunity is claimed after an attack of yellow fever, granting that a second should occur, it is reasonable to expect that the subject would have received some degree of protection by the first, or at least some amelioration of the severity in the second. This view would appear to us to be reasonable, by analogy with smallpox or vaccinia, which, though it may not give perfect immunity, generally grants an amelioration in the symptoms of the disease, should the subject undergo a subsequent attack of smallpox.

There is also another point to be considered as bearing upon the claims of the ephemeral form of fever of the last epidemic, to a position by the side of yellow fever. The mortality of yellow fever has varied as much as its symptoms in different epidemics,

but in the undoubted cases of the disease it has invariably been high. The mortality which always attends its presence has obtained for it a position as one of the most malignant and fatal of diseases, and given it a rank by the side of the oriental plague, and the great loss of life in proportion to the number of the sick has branded it as a fearful calamity.

"In this latter respect no disease, the black plague of the fifteenth century and the Asiatic cholera in our own days excepted, can compare with it. The oriental pestilence itself, though it occasioned, a century or two ago, a frightful mortality throughout many parts of Europe, and though it has given rise up to this day, at each epidemic return, to a mortality equally large in proportion to the number of individuals attacked, did not, at the time of its widest diffusion, or, if it did, has long since ceased to produce as great loss as has resulted from the disease in question." (La Roche.) It is true that the disease has at some periods presented itself in greater degrees of malignity than at others, but this fatality has always been one of the characteristics of the genuine disease. So firmly has this characteristic of yellow fever impressed itself upon the minds of writers and observers of the disease, that the unprecedented success of treatment claimed by Hastings and others has suggested doubts of the genuine character of the disease with which they had to deal.

Dr. Barton says: "It has been expressed to me by some of our oldest inhabitants, those who have been observers of the disease twenty or thirty years ago, that it was no longer the same disease, that in fact the unequivocal malignancy and peculiar type which characterized it exist no longer; and this is most amply verified by the symptoms, aspect, and history of the disease, as seen and described by those who had witnessed it from 1804 to 1832."

The epidemic of 1871 bears a most remarkable contrast, as far as malignity is concerned, with the former epidemics which have visited this city previous to 1849 and to that of 1858. As already shown, the proportion of mild ephemeral or break-bone fever to the marked yellow fever was large, and in the former there was no mortality. As to the marked cases of the latter, which corresponded with the history usually assigned to the stranger's fever, we cannot say the same, for the mortality in these varied from 5 to 40 per cent., and even much higher. These cases presented no change of type, but bore on their face their true character and family resemblance to the old stock.

How then are we to account for the mild fever? In answering this question we must review the characters of the epidemics of this city and note their variation.

Previous to 1849, the yellow fever remained unchanged in its type; when it affected strangers, it showed the same malignant features as that of the West Indies, and so also it did in 1858.

In 1850, break-bone or dengue visited Charleston, and prevailed in the form of a wide-spread epidemic. In 1852, when the yellow fever again appeared, it presented itself, accompanied with an unusual number of mild cases, which were recognized by many as bearing the stamp of the epidemic of 1850. That this is not merely a local tradition, we may see from the following quotation from Dr. La Roche's book. In speaking of the complications of yellow fever, he remarks: "The yellow fever which prevailed in Charleston in 1852 was accompanied by and blended with dengue or break-bone fever." In 1858, yellow fever presented itself again in its true garb, as may be noted from the fact that in a population of less than 60,000 there were 680 deaths.

Again, in 1866, there prevailed a wide-spread epidemic which attacked the great mass of the people, nearly every one being sick during its course, irrespective of acclimation. As we have stated, this disease did not present the type of yellow fever, and was variously classed as dengue, break-bone, relapsing, and sweating fever, and yet there were a few cases of sporadic yellow fever.

In 1871, yellow fever was again present in its unmistakable form, but accompanied by and blended with a fever which did not, by its symptoms or course, uncomplicated, demonstrate its family relationship to the former, except in the fact of its occurrence at the same time as the first.

The mild form of fever made its appearance first, which is in direct opposition to the usual history of other epidemics, in which this form presented itself, as the more severe disease died out.

It is true that the mild fever of 1871 did not present the course perfectly of dengue; but, on the other hand, it could not, except in the presence of yellow fever, be diagnosticated as belonging to the same group as the latter.

It can scarcely be denied, in view of these statements, that the epidemics have undergone a change of decided amelioration in their character. This change cannot be said to have taken place in the yellow fever proper, for we meet with it in its usual form. We are, therefore, for our part, compelled to seek for the explana-

tion of the unprecedented prevalence of mild cases, during the last epidemic, in the fact that, since the occurrence of dengue or break-bone, its impress has remained; and that these mild cases result from a combination of the yellow fever with the former, and the mild forms are the result of the mutual moulding—the special characters of one being more prominent in some cases, whilst those of the other are in the ascendency in the others.

Dr. Barton remarks: "Many instances were mentioned, and will be found in our records, of repetition of attack, and the liability of those born here (and not of creole parents, and some that were, and grown) were very numerous, more so than has ever been noticed before, even reaching the limits of adult life, and the dread of yellow fever began to be brought home, and even experienced by the fully developed natives. This has been attributed during the fever to the uncommon malignity of the disease. May be the opinion I have heretofore advanced is the true one, and I repeat, although in vivid recollection of the scenes of last year, that the clear and unequivocal type is not so distinctly manifested in the mass of cases as it was twenty or thirty years ago.

"A hope is entertained in Charleston, that from the liability to attack of the more advanced adults, and in proportion to this retardation of age, 'there exists the strongest possible proof that our circumstances are undergoing a change of nature calculated to sustain the opinion that yellow fever is gradually ceasing to be an endemic or climatic disease among us.' If this is true, I know no reason why it may not apply also here, ... the fever is becoming more indistinguishable from the ordinary fevers of the season and country."

With these observations, from such authority as Dr. Barton to sustain us, we feel less reluctance in expressing the opinion that we have advanced, namely, that the mild characters of the epidemics in Charleston since 1850 (except 1858) are due to the mutual modification with dengue.

Origin of the Epidemic.—In considering this portion of our subject, we will first investigate the facts relating to importation, as the possible means of the introduction of yellow fever into the city of Charleston in 1871, and we will draw largely upon the report of Dr. Lebby, Port Physician, for the facts. He says: "It is a remarkable fact, and an occurrence which has never taken place before in my experience, that from the 1st of May at sunrise, until the 25th of September, not one single case of sickness came into

the port of Charleston, nor an infected vessel. All the vessels from the West Indies were in ballast, with healthy crews and in good condition, including a few fruit schooners from Ilethuria, Harbor Island, Barracoa, and Nassau, where no fever has ever existed, except the last-named."

"The last arrival previous to the occurrence of yellow fever in the city was on the 25th of June, the vessel and crew in good condition and healthy. The only case of sickness was from scurvy, on a vessel one hundred and twenty days from Callao, which came in on the 25th of September."

The following shows the number of vessels that arrived and were examined at the quarantine in Charleston harbor, from the 1st of May, 1871, to the 31st of October, 1871:—

1871. Months.	Steamers.	Ships.	Barks.	Brigs.	Schooners.	Sloops.	Total.
May	26	...	6	11	22	1	66
June	22	...	6	4	26	...	58
July	28	...	3	7	18	...	56
August	23	...	6	2	17	...	48
September	22	...	2	2	20	...	46
October	16	1	4	2	18	...	41
Total	137	1	27	28	121	1	315

The following shows the localities whence they came and their condition upon arrival:—

1871. Months.	Coastwise.	England.	West Indies.	Malaga.	Callao.	S. America.	Total.	Number healthy.
May	52	...	13	...	1	...	66	66
June	50	1	6	1	...	...	58	58
July	56	...	...	...	...	...	56	56
August	44	3	1	...	...	...	48	48
September	43	1	1	...	1	...	46	46
October	35	2	3	...	...	1	41	41
Total	280	7	24	1	2	1	315	315

"From the above tables it will be seen that there was no arrival at this quarantine from the West Indies during the month of July. In June there were six, the last on the 25th. In August there was one arrival on the 24th. This vessel was quarantined thirty days

until September 23d. Except those from coastwise ports, all these vessels were quarantined twelve to thirty days, exclusive of the number of days they were at sea, and most of these were in ballast with perfectly healthy crews who continued so; several of the vessels did not go up to the city, but were towed up Ashley River, loaded with phosphate rock, and from thence proceeded to sea."

On the 20th of June, a quarantine station was established in St. Helena Sound, to the north of Morgan's Island, and equidistant from the entrances of Bull and Coosaw Rivers, distant between seven and ten miles from the settlements on Chisolm's and Hutchinson's Islands, and about sixty miles from Charleston. Dr. W. H. Bailey was put in charge as quarantine officer. I take the following from his report: "On the 30th of June, the barkantine Teresa, Captain Adams [with ten men] arrived from Havana with the first mate and one seaman convalescing, but still weak from fever. . . . . She was brought up by pilot Davis into Bull River; I visited her in Bull River, reprimanded the pilot for transgressing the quarantine laws (I did no more, because the quarantine had been but recently established), and ordered the vessel to the quarantine ground. She dropped down to that point, and remained there until the morning of the 31st of July, having been released on the 30th."

"On board the Teresa I found the first mate and a sailor convalescent but still weak from fever; the second mate quite sick (from fever, also), but just entering upon convalescence; and a sailor decidedly very sick. I could not then, nor am I willing now to, characterize this fever as yellow fever, although circumstances seemed to render such an opinion probable at least. The mates and the first sailor to whom I alluded, recovered; the last convalesced so far as to be able to walk about the deck, overate himself, had a relapse, and died on the 10th of July. This is the only death which had occurred at the quarantine ground, and, with one exception, the only white death which we have had on Bull River or its vicinity this summer. . . . . I have stated that there was one white death at Bull River this summer. The unfortunate victim was warned, as well by myself as by others, in vain; intemperance and an exposure brought on the attack. . . . . I am satisfied he did not die of anything that even resembled yellow fever. To this I am willing to make affidavit."

We have evidence that the Teresa did not impart infection at Chisolm's Island where the Mining Companies carry on their

operations. We have mentioned only the Teresa at St. Helena Island, as no other vessel from an infected port arrived at that station until August 17th, except the Raleigh, which arrived in June, and had previously been admitted to pratique by the officer at Hilton Head.

The first case of yellow fever, as we have already mentioned, was that of Lizzie Clark, at No. 10 Chalmers Street, who was attacked between the 16th and 19th of July, and died on the 25th, sixteen to nineteen days after the arrival of the Teresa at the quarantine station at St. Helena Sound. Between these points, Charleston and St. Helena Sound, there is difficult and not very frequent communication. This case was attributed by report to communication with the second mate of the Teresa. Dr. Ancrum, who attended this case, reported to the Medical Society "that the report was false which attributed her illness to communication with a man from a vessel infected with yellow fever at Bull River. The origin of the report was probably in the fact that six or eight months previously a young man who lives on Bull's Bay had been with her." In addition to this statement of the attending physician, based upon information obtained at the time, we have the following testimony from totally different sources.

Dr. Lebby in his report says: "On the 11th of July I boarded the Teresa at quarantine grounds, St. Helena Sound, and examined her captain and crew personally. Both of the mates were on board on the 12th of July when I passed in the steamer on my way back to Charleston. It was impossible for either mates or crew to arrive in Charleston before the 14th, and then only by way of the Savannah and Charleston railroad, a distance of twenty-six miles from the vessel's location, which renders their presence in Charleston almost an impossibility. But the testimony of the second mate and two of the crew, taken by Mr. David Lopez and Captain Henry J. Elliott, gentlemen of the highest respectability, in whose employ at the Coosaw Works these men are now, will show the utter falsity of these rumors." The following questions were put and answered:—

1st. "Were either of the mates or any of the crew of the barkantine Teresa from Havana, in Charleston or Beaufort between the 30th of June and 31st of July?" "No."

2d. "During the time the Teresa was at quarantine did any of the men desert from her, and return back on board?" "No."

3d. "On her discharge from quarantine, and her arrival at the

Coosaw Works, how many men, captain included, were on board the Teresa? "Ten" [the complement of the ship on her arrival].

4th. "Did the mates and captain remain on board the Teresa until loaded, and proceed to sea in her? and were they ever in Beaufort or Charleston to your knowledge or Capt. Elliott's?" "*They did remain on board,* except Captain Adams, who visited Beaufort on the night of August 14th, and went to Charleston next day by Charleston and Savannah Railroad, and returned on the 17th by steamer Pilot Boy, and got on his bark, and was never ashore after. The second mate and two seamen have been employed at the Coosaw Works since the bark left quarantine."

It is evident, therefore, that by the mate's own statement, corroborated by the evidence of others, he did not go to Charleston, and as a necessary consequence had no communication with Clark. Capt. Adams, the only person of the ship's company who did go to Charleston, did not arrive there until the 15th day of August, before which time, as we have stated, yellow fever was present in this place. The barkantine Teresa must be acquitted from the charge of having introduced yellow fever into Charleston.

There is yet another report which must be considered in this connection. That the crew of a vessel in Bull River from Havana deserted their ship and were arrested on their arrival at Charleston. There was ground for this report, in so much as that a desertion took place from a ship, but not from a vessel from Havana. In proof of this we will again extract the facts from Dr. Lebby's report. He gives the written statement of Captain John Johnston, a shipping broker of this city, who says, "I shipped from this city, on the 28th of August, seven white men for the bark Raleigh, loaded with phosphate rock in Bull River and ready for sea. The second or third night they took the 'ship's boat,' deserted and returned to Charleston; after their arrest the Captain refused to receive them, and I shipped seven colored men in their place, when she went on her voyage."

There are three reasons why this occurrence cannot be taken in evidence as favoring the hypothesis of importation. 1. The men went from Charleston. 2. They remained only two days on board the ship, which had been admitted as in a healthy condition at Hilton Head. 3. And, most important, this desertion took place nearly thirty days after yellow fever had been developed in the city of Charleston.

As will be seen by reference to the tables of arrivals at the port

of Charleston, already introduced, the last arrival from the West Indies, preceding the outbreak of yellow fever, was on the 25th of June, and the ship was in good condition, with a healthy crew, and with no history of sickness, previous to her arrival, on the voyage. It appears to us that it would be unfair to attribute the disease to this ship, for it did not exist in her at the time of her arrival, and she had not suffered before, and did not afterwards suffer from it, and especially as she was in ballast.

Were this not sufficient to convince, the evidence is completed by the fact that the disease did not begin its attack on those who were likely to be brought into connection with the shipping, but first appeared in a location distant from the wharves in a part of the city, the situation of which does not bring it in connection with the commercial portion of the community. It is, moreover, stated, on the authority of the Rev. Mr. Yates, seaman's chaplain, whose works of humanity and philanthropy, especially among the sailors, are well known in our community, and who has had much experience in the epidemics which have visited this city, that there was not a single case of yellow fever occurring among the sailors until the middle of October, and then not exceeding three.

The second case occurred on the 29th of July, at Mr. Claussen's steam bakery in Market Street, in the person of a cake baker. It is not natural from the character of this man's employment that we should expect to find him engaged on shipboard, and in any way connected with the shipping. We have been informed, on inquiry at Mr. Claussen's, that this man had not been in any way exposed to such infection, and that his employment did not even require his presence in that portion of the establishment where he would have come in contact with others who might have been engaged in the shipping. It was not until a number of cases had already been developed that we met with the disease among the fruit dealers, who have their depots on Market Street and East Bay.

We have not in the history of this epidemic those instances of laborers engaged in loading and unloading ships as the first affected, which have in some of the former epidemics furnished the grounds of argument to those who espouse the cause of importation to the exclusion of any other mode of origin for yellow fever.

The Marine Hospital played no part in the history of this, as it did in some of the former epidemics.

There is another fact which will prove of interest to those who

devote much thought to the origin of yellow fever. In the report of the Registrar of the City of Charleston we find this statement: "The first death from yellow fever in New Orleans, in 1871, took place on the 4th of August, the last on the 4th of December." The first undoubted death from yellow fever in Charleston took place on the 3d of August, and Clark, the case reported as icterus, died on the 25th of July. The last death was on the 6th of December. This might be considered as a mere coincidence but for the fact which we will now state.

Dr. R. A. Kinloch, in an article on the yellow fever which appeared in 1857 at Mount Pleasant, *Charleston Medical Journal*, January, 1858, says: "The bills of mortality of the two cities of Charleston and New Orleans, up to the middle of September, proved them to be exempt from yellow fever. But after this date we find the disease appearing in both of these cities about the same time, and prevailing to a very limited extent, proportional in each to their population. Is it likely that germs of a foreign disease should have arrived simultaneously in both places? If they did, it was a remarkable coincidence."

In 1871 we again have a repetition of this "remarkable coincidence." To us it has a significant bearing upon the origin of yellow fever, and goes far to substantiate the views of those who believe in the influence of geographical position.

Perhaps there is no subject in the scope of the science of physic which has been so thoroughly discussed, and has been the cause of more able and angry controversy, than the origin of yellow fever.

Since 1849, in Charleston, the line has been sharply drawn between those, on the one hand, who believe in importation, and, on the other, those who have put their faith in the local origin of the disease. Up to a comparatively short period no middle ground was allowed; the contest was, importation against local origin, and on this ground rested all controversies.

We do not propose to enter into this contest, nor to deny the portability of yellow fever, and its propagation under favorable circumstances, but we cannot admit this as the only or general origin of the disease, at least in this locality.

The epidemic at Wilmington, North Carolina, in 1862 (an account of which, by Dr. Wragg, can be found in the *New York Medical Journal* for August, 1869), goes far to prove local origin, and it must be admitted that the condition of that city at the time of the outbreak was eminently fitted to produce disease. Few can read

the accounts of that epidemic without being convinced that, in the face of the fact of the occurrence of several cases of yellow fever, before the arrival of the steamer Kate, to which the importation of the disease is by some assigned, the charge cannot be sustained.

The epidemic of 1871 has unequivocally eliminated the factor of importation from the influence which brought about the disease, and even the most enthusiastic importationists are dumb. Beyond this, the epidemic of which we have treated has produced no new fact which bears upon the peculiar and specific cause of yellow fever. The same mystery still hangs about it which has always invested the subject, for the discovery and unravelling of which the noblest minds have labored in vain. That importation, so far as Charleston is concerned, is not sufficient to propagate the disease, is proved incontestably by the history of the outbreak in 1854.

On the 11th of May, the Isabel arrived from Havana and Key West. Three days after her arrival, a steerage passenger, who had been taken in at Key West, was sent to the Marine Hospital with well-marked symptoms of yellow fever; he recovered, but threw up black vomit freely. He was placed in a ward with others sick of other diseases, and no propagation of the disease occurred, either by contagion or by infection. On the 11th of July, the Isabel again arrived from the same ports, one of her passengers, an Irish nurse, went to the Pavilion Hotel, at the corner of Hasel and Meeting Streets, in the heart of the city, complaining of the effects of sea-sickness. On the following afternoon she attempted to leave in one of the New York steamers, but was prevented by her extreme illness. She was sent to the lazaretto the same evening, and died that night, throwing up black vomit freely. Again there was no extension of the disease. On the 26th another vessel arrived from Havana. It was not for some time after, that yellow fever appeared in the city.

It is evident, then, that some factors other than importation are necessary to produce an epidemic.

Heat and moisture, or dryness with animal and vegetable decomposition, and absence of electricity from the atmosphere, have been invoked to solve the problem, but the difficulty yet remains. What is the subtle combination of telluric and atmospheric influences necessary to produce yellow fever in epidemic form yet remains a mystery, and cannot even now be more satisfactorily explained than by the trite expression of Sydenham, "an epidemic condition of the atmosphere."

Having failed to prove importation in 1871, we must look amongst ourselves for the cause of the disease. Next to importation must be considered the question of propagation from dormant germs. The theory of germs as applied to disease is yet an open question, especially in its relations to yellow fever; we will not, therefore, enter into it. There are, however, certain facts in relation to its bearing on the epidemic of 1871, which should be mentioned.

The germ of yellow fever, if it does exist, and whatever it may be, should be specific, and as a consequence must be the result of the propagation and germination of its like. It is most natural, if this proposition be granted, to look for the parent in the next preceding epidemic, which is that of 1864. Granting that the germs of this epidemic escaped the wilting cold of our winters, there is yet an obstacle to their acceptance as the cause of the disease of 1871.

In 1864, Charleston was in a state of siege; its lower portion from Calhoun Street to the White Point Garden was under the fire of shells, and deserted by its population. The streets of this section, and the waste places left by the disastrous fire of 1861, were overgrown by the natural spontaneous growth of weeds, which reached to the height of a man's head, giving to the locality the appearance of a deserted city. The people had collected in the upper portion of the city, above Calhoun Street, which extends east and west from river to river. Here it was that the yellow fever prevailed, and not in the lower districts, which were uninhabited except by the small garrisons which acted as guards to the batteries on White Point and the Cooper River.

The fever is said to have begun in the northwest portion of the city, in 1864. In 1871, as we have already shown, it commenced its attack in the southeast, and prevailed in the lower districts to a great extent before a case appeared in the upper wards, which had been the scene of its action in 1864.

Although we do not propose to enter into a discussion of the causes of local origin of yellow fever, there are some facts in the history of the fever, in its connection with Charleston, bearing upon this point, which should be mentioned. We allude to the close connection of the disease with reclaimed land, and the filling of low places with the offal and scavenger accumulations of a closely inhabited city.

"The site of Charleston in its natural state was a slip of land

stretching southeastwardly between two rivers, and projecting into the harbor formed by their junction, and divided into a number of peninsulas by creeks and marshes, indenting it on three sides so as to leave but little unbroken highland in the middle. (*Ramsay's Medical History of South Carolina.*) Under these circumstances the town was a prey to malarial fevers, which rendered it almost uninhabitable from June to October. By the process of filling and building, these fevers gradually diminished, and at the present day have disappeared. Dr. Ramsay continues, in speaking of this amelioration produced by this process, "From the operation of these causes a change for the better has already taken place to a certain extent." "With the exception of the more frequent recurrence of the yellow fever, Charlestown is more healthy than it was thirty or forty years ago. . . . . Bilious remittent autumnal fevers have for some time past evidently decreased."

It has been attempted of late years to explain the disappearance of malarial fevers from Charleston, on the supposition that they were chased away by the more powerful yellow fever; but this explanation scarcely accords with the observation of Dr. Ramsay, just recited. It would appear to us that by the very process by which the one was diminished, the other has been increased. In illustration of this view, we will mention certain facts for which we are indebted to the reply of Dr. Wragg, 1859, to a letter from Alderman Robert Lebby, M.D., addressed to certain members of the profession of Charleston, asking their opinions on several questions as to yellow fever.

In 1833, yellow fever was localized and bounded by lines, which, although they may have been overstepped in some points at times, were nevertheless tolerably accurate limits to the infected district. The southeast part of old Charleston was the doomed territory, and Water Street on the south, King Street on the west, a line somewhat below Calhoun Street on the north, with Cooper River on the east, formed its boundaries. The west end of Broad Street was considered safe, and all that part of the city known in old times as Harleston's Green, lying west of Rutledge and north of Beaufain Streets, was still more exempt. Cannonsborough, still further north, was a safe resort for strangers, provided they did not go far enough up on the neck to incur risk from country fever. The same may be said of Mazychborough, Wraggborough, and Hampstead, on the east of the city, and also of the intermediate central ridge from the citadel and St. Paul's Church, upwards until the

region of country fever was reached. As late as 1838, it was safe for strangers to remain in the city in yellow fever seasons, provided they did not go below Calhoun Street. At the present time there is not a location within the city boundaries which can be said to be free from liability to the disease. In former times it did not intrude upon these regions which were blest with a peculiar immunity, but in 1838 the spell was broken, and safety was no longer found in one at least of the favored precincts. Cases of the disease occurred in the neighborhood of Judith and Elizabeth Streets, this year, for the first time. We quote from Dr. Wragg's letter above referred to.

"Let us look around and see if any local changes in the region about the houses may have had influence in producing them. A year or two before John Robinson had commenced the improvement of his lots partly on Judith Street, and in the square bounded by Elizabeth Street on the west and Alexander Street on the east; these lots were low and were near the mouth or outfall of a long narrow marsh flat, which, commencing here, ran from an eighth of a mile westward, as far as King Street. The natural effect of the filling up of these lots was to injure the drainage of all that part of the marsh flat lying west. So completely was this effect produced, that frequent inspections were held yearly for the purpose of remedying the nuisance, but in vain, since the stoppage of the natural drainage could only be compensated by artificial drains of sufficient size and depth to take off water, while at the same time provision should be made for improvement of the low ground above. But as there was no authority or means to carry this into operation, the nuisance became more and more intolerable from year to year." "For the improvement of his lots Mr. Robinson had used wood and other destructible material to a considerable extent, and had also transferred by means of a temporary railroad the whole of the mound of earth (a remnant of the old ~~times~~ lines) which formerly stood at the corner of Meeting and Mary Streets."

"From this time the exemption previously enjoyed by this region vanished. Since then we have not only seen yellow fever claiming its victim there, but typhus, scarlet, and other epidemic fevers have from time to time severely scourged it. About the time of which I am speaking, the eastern end of Calhoun Street was in the enjoyment of a reputation for health not inferior to any other portion of the neck. I well remember, that, in 1836, when cholera made its visitation to Charleston, I only saw a single case

in that part of the street where the free ebb and flow of the tide over the low grounds kept them clear of decomposable deposits. Within the last ten years the street has been made up with wood and the low lots filled with chaff, sawdust, and such destructible material, and now the neighborhood has lost its reputation for health. Within the last twenty years, during which time the work of filling up low places with garbage, sawdust, chaff, etc., has been going on on Gadsden's wharf, that place has been steadily becoming more and more unhealthy, till last summer the work of death was so actively carried on that the population was almost decimated. Since the filling up of White Point Garden with the same destructible materials, yellow fever has got a foothold along the formerly healthy region of South Bay . . . . The same observation holds good for all the shore line of the Ashley, and accordingly we see victims of the disease in Legare, Gibbes, Tradd Streets, etc., and when you reach the low grounds extending from Tradd Street on the south to Beaufain Street on the north, and from Franklin on the east to the river on the west, you come to one of the most infected of all the districts of the city. . . . . You will remember that this very spot was referred to above as one of those in which even the stranger felt secure in former times from yellow fever. The change that has taken place is its conversion from a marsh overflowed twice in twenty-four hours by pure sea water into a porous, putrefying, undrained soil, composed almost wholly of the offal of the city. . . . . The jail and Marine Hospital have occupied their relative situations for fifty years. During the whole of this long period the hospital has received and treated yellow fever patients; while I was a student I have taken my first lessons in the disease at the bedside of patients who might have almost jumped from their beds into the inclosure of the jail; but never was the yellow fever known to have entered that building till 1852; since then it goes into it as regularly as into the houses of Elliott Street. Let us turn to the condition of things in the neighborhood, and we will find just such a change as has been shown to have been the precursor of the introduction of yellow fever into all the other locations referred to above. And the remarks made in reference to the jail hold good with regard to the private residences around these buildings. The offal of the city makes the soil all around. . . . . It has been stated above that the once healthy region known as Harleston's Green is no longer exempt from epidemics of yellow fever. The same local changes have taken place there.

Low places have been filled up with the usual mixture of animal and vegetable compost, and while the pure tide water of the ocean has been excluded, its healthful presence has been replaced by filth, corruption, and putrefaction. . . . . This region previous to the changes I have been tracing was a country fever district. It at once became the nidus of yellow fever."

We have introduced this long extract for the reason that it contains facts historical of the march of yellow fever in the city of Charleston. That the influences above mentioned are great in the production and spread of yellow fever, the fact of the occurrence of epidemics after large fires goes far to prove. The first appearance of the disease in Charleston in 1699 or 1700 followed upon the "calamities resulting from a disastrous fire and a fatal epidemic of smallpox."

The municipal authorities, taught by the hard lessons of experience the truth of the deductions mentioned above, passed the most stringent laws forbidding the use of such material in filling up and improving lands; which, if they could not undo the damage already done, would prevent the further extension of the evil. From 1861 to 1865 the exigencies of war prevented the proper execution of sanitary policing, the evil results of which negligence culminated in the epidemic of 1864. Since 1865 these laws have been treated as a dead letter, partly from the necessity of filling up lots which had been dug out to furnish earth for the building of the numerous batteries which dotted the sea face of the city, partly from the ignorance of the traditions of the city on the part of the executive officers of the municipal government, many of whom dated their residence in this city but a few months back. Lands were reclaimed and stolen from the domains of the tide-water; the materials used in this improvement of property being the same disease-generating putrescent compost of garbage and city offal. In 1869 the work was begun of filling and reclaiming certain water lots composing Bennet's millpond, covered in the natural state by tide-water let in through floodgates. These water lots are situated in the northwest portion of the city, bounded on the north by Vanderhorst Street, south by Calhoun Street, east by Smith Street and the rear of lots on the west side of the last-mentioned street already built upon, and west by the rear of premises fronting on Rutledge Avenue. By the order and with the consent of the then Mayor, the city scavengers were ordered to deposit the accumulations of city garbage and offal on this spot. On a reference to the

records of the City Council, February 23d, 1869, we find two memorials from citizens residing in the neighborhood, bitterly complaining against the procedure, for the reason that the "stench arising from the large quantity of offal collected is already offensive, and we believe will be the cause of much sickness as the weather becomes warmer." "The number of buzzards collected by the carrion seriously damage the water of the cisterns by defiling the neighboring sheds." At the urgent solicitation of these memorialists, a committee of five of the prominent medical men of the city was appointed to investigate the matter, and through their chairman, in a report, set forth at length the injurious results to be expected from the process of decomposition which would ensue, and recommended the immediate cessation of the work and the covering of the deposit already made by dry sand. This was done, not, however, until too late to prevent much mischief, which was manifested by the occurrence of typhoid fever in the neighborhood soon after. In the latter part of June, 1871, Vanduhorst Street, from Rutledge Avenue to St. Philip's Street, was graded, covered with large stones, and the interstices betweeen them filled with small stones. Over this was spread the black mud, containing the results of the drainage and filth of the neighboring premises, taken from the tidal drain in Coming Street. About the same time, lots on the corner of Rutledge and Calhoun Streets were prepared for building, by laying on the mud of the water lots beams of wood side by side, and these were filled upon by shavings, sawdust, and black earth. What was the result of all this? We learn from the report of the City Registrar that fifteen cases of yellow fever occurred in Pitt Street, and many deaths in its vicinity. This street passes from Vanduhorst Street, and runs parallel with Smith Street on which the offensive lots are situated, and one square east of it.

Let us go from here to Market Street, where the yellow fever showed itself in its most virulent form. On the 11th of July during the absence of Dr. Lebby, the City Registrar, a new drain was constructed one hundred and twenty yards east of Meeting Street and about one hundred and fifty yards from Mr. Claussen's. On opening the main sewer with which the new drain was to be connected, so offensive was the stench, and so noxious the gases which were diffused, that the workman who was engaged in the work was removed in an insensible condition and suffered a severe illness. Next to Mr. Claussen's establishment, and separating it from that

of Campsen & Co., is an alley known as Rafer's Alley, running north and south from Market to Guignard Streets. The condition of this alley has been described to us by the employés of Mr. Claussen as having been most filthy previous to the outbreak of the yellow fever, and the stench arising from it very distressing. The drain which passes through its length had caved in, and the noxious gases which arose from it were diffused in the atmosphere of the neighborhood. This alley had already been reported as a nuisance, and the neighbors, fully impressed with the necessity of remedying it, had offered to the municipal authorities to share in the expense of its repair. We learn from the report of the City Registrar for 1871, that, with the exception of part of Tradd and Thomas Streets, the sewers are filled up to the crown of the arch, and in the large majority have not been cleaned since 1859 or 1860. In addition to these fruitful causes of disease, the meteorological phenomena of 1871 were eminently suitable to convert into an epidemic any disease capable of assuming this form in the summer season. In May, June, and early part of July there was extreme heat and dryness, which continued nearly forty days. Only 1.47 inches of rain fell, at long intervals and in light showers, with a mean temperature of 83.84°.

Between the early part of July and 1st of August there was a period of intense heat, the thermometer rising to 102° on July 10th. From the latter part of July to the end of October there were heavy rains and a noted absence of electricity. During the four months, July, August, September, and October, there was a rain-fall of 27.20 inches, and a range of temperature from 57° to 102°. During the rains of the last of July and beginning of August, the collections of water in the cellars and burned district were so extensive as to require the use of the steam fire-engines continuously for days to remove it. In some localities as fast as the water was removed from the cellars they were refilled by the percolation of the subsoil water, and in some instances they had to be pumped out three or four times. On Market Street the cellars of the fruit shops were in an extreme degree of filth. They are dug in the made land, of which a large part of this portion of the city is composed, and their contents of cabbage leaves and other refuse attendant upon shops of this kind, when saturated with the water of the heavy rains, acted upon by a burning sun, produced a state of things not easily described.

Yellow fever also visited the town of Beaufort in 1871. In the

recollection of the oldest inhabitants, this town has been visited only three times by this disease; first in 1817, next in 1854, and in the last year.

The first case occurred on August 6th, in a man, who was brought from Bull River, sick with fever, and died on the 17th with marked symptoms of yellow fever. The disease ran its course from this time until November 21st, when the last case terminated fatally. "There were forty-one cases among the whites, and one colored; seven of these (whites) died." We regret that we are unable to enter into the details of this visitation, by reason of the absence of the necessary data.

It is a matter of regret that we have not obtained more extended statistics from other parts of the State in relation not only to the meteorology but the diseases that may have prevailed during the period of which we have treated, hence, we have been obliged to be restricted in this report principally to Charleston.

Inasmuch, however, as the disorder we have chiefly discussed, not only a scourge to the people of Charleston but a terror to all strangers who may have propinquities towards the city, has occupied so much attention both at home and abroad in scientific and other circles, we may find some compensation for the paucity of other interesting materials from different portions of the State.

Whatever may be the origin of the epidemic in the consideration of which we have been engaged, those who would lend their energies to the prevention and removal of the agents likely to contribute to the diffusion and continuance of the distemper before it does assail us, although they may not succeed in excluding it altogether, would confer a blessing not in health only, but in all the avenues of comfort and prosperity, which would entitle them as well to the gratitude of our people as the universal commendation of all the humane.